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25 June 1985

USSR REPORT ENERGY

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COAL

ECONOMIC BASIS FOR WORKING MARGINAL ANTHRACITE RESOURCES

Kiev UGOL' UKRAINY in Russian No 12, Dec 84, pp 15-16

[Article by V.I. Malov, candidate of technical sciences Torezantratsit Association, and V.I. Salli, candidate of technical sciences, Dnepropetrovsk Mining Institute: "Economic Substantiation for Working Non-Balance Anthracite Resources"]

[Text] In the Torez-Snezhnyanskiy coal-mining region, coal output is being held back due to inadequate replacement of equipment losses and more complex geological and mining conditions at operating mines as development depths are increased. In order to maintain planned production, coal seams with less favorable occurrence are being mined.

The mines of the Torezantratsit Association have exhausted 43 percent of known prime resources. It should be noted that 52 percent of the association's resources is concentrated in the territory covered by the Progress and the Imeni Lutugin mines and the Zarya Mine Administration. In 1981, the Removskaya and the Voskhod mines exhausted their resources; a similar situation is expected soon at the Chervona Zirka, Severnaya, Snyezhnyanskaya, Ob'yedinennaya and Miusskaya mines. Thus, about 40 percent of currently operating mines will be shut down because of the depletion of prime recoverable reserves.

Taking into account the formed circumstances for maintaining output at planned level, some mines are forced to work seams previously considered substandard because of their high ash content and thickness. From 1975 to 1983, output from the non-balance reserves rose from 22 to 36 percent, and it keeps increasing.

At the present time Torezantratsit Association and Dnepropetrovsk Mining Institute are carrying out research to determine the required volume of output from substandard seams based on the economic evaluation of reserves and to develop engineering and organizational measures aimed at maintaining the production capacities of the mines. The results are described below.

Substandard reserves may be targeted for commercial mining provided new machines are developed, methods of coal production and processing are improved, new standards set for commercial production, and economic conditions

Table 1.

Варианты 1.	2. Затраты по годам, млн. руб.									3. Суммарные дисконтированные затраты млн. руб.
	1	2	3	4	5	6	7	8	9	
I	9,72	8,97	8,30	7,72	7,14	6,60	6,10	5,60	5,25	65,40
II	11,30	10,43	9,68	8,97	8,30	7,67	7,09	6,56	6,10	76,10
III	10,06	9,29	8,63	7,99	7,39	6,84	6,37	5,74	5,20	73,51

KEY: 1. Variants
 2. Outlays by year, in millions of rubles
 3. Total discounted expenditures, millions of rubles

created under which the operating outlays for coal production, transportation and preparation are less than the long-run marginal costs [zamykayuschiye zatraty]. The latter is the maximum adjusted [prive dennyy] cost of each additional ton of coal mined to compensate for mines that are shut down ahead of plan, permitted from the point of view of the national economy, as a whole. Mining of the substandard resources is economically justified if the difference between the long-range marginal and the operating cost is positive. Then the condition of feasibility for mining substandard seams is:

$$\left[\sum_{t=1}^T \frac{3_t \Delta_{it}^k + 3'_{it} \Delta'_{it}}{(1 + E_{\text{Hn}})^t} - \sum_{t=1}^T \frac{3_{it} \Delta_{it}}{(1 + E_{\text{Hn}})^t} \right] > 0,$$

where: 3_t - long-range marginal cost per product unit in t-th year;
 Δ_{it}^k - volume of production needed to compensate for the closing of i-th mine in t-th year;
 $3'_{it}$ - operating cost of mining of remaining prime reserves at i-th mine in t-th year;
 Δ'_{it} - production in t-th year of the i-th mine that is being closed;
 3_{it} - operating cost at i-th mine in t-th year while both prime and substandard resources are mined;
 Δ_{it} - production at i-th mine in t-th year while both prime and substandard resources are mined;
 $\frac{1}{(1+E_{\text{Hn}})^t}$ - coefficient of adjustment of expenses incurred at various times.

As an example, economic substantiation of mining substandard resources at the Severnaya Mine is discussed. Its yearly production capacity can be maintained only if both prime and substandard resources are mined in a 49 to 51 percent proportion at R20.20 and 23.50 cost per ton of mined coal respectively. The remaining operational life of the mine is 9 years. If the substandard portion of reserves is not mined, the yearly output of the mine will be cut in half. Modernization of the transportation facilities--if only the balance reserves are mined--will increase the yearly output by a factor of 1.6, but it will require additional capital investments which will increase the cost per ton of fuel from R20.20 to R20.90.

The following alternatives have been considered:

--(I.) Mining of both prime and substandard reserves while maintaining the current level of production; 9 years mine life;

--(II.) Substandard resources are not mined; production capacity cut in half; 9 years mine life. A yearly production of 250,000 tons of coal can be provided from the marginal [zamykayrishchiy] deposit. The compensating cost, R30.00/ton, is determined by the application of the ranking method utilizing data on net cost of coal at the anthracite mines in Donetsk Oblast;

--(III.) Substandard resources are not mined; capacity drops by a factor of 1.6; remaining mine life is 6 years. Annual compensating production will be 120,000 tons for 6 years, and then increase to 480,000 tons.

The outlays for these alternatives taking the time factor into account are presented in Table 1. The figures show that the greater the reduction in mine capacity when economically feasible resources are not mined, the higher the overall outlay for production. The consequences of loss of resources at other mines were estimated in a similar manner (Table 2). The ratio of production volumes from prime and the substandard resources was determined by the dynamic programming method based on a criterion that takes into account the effect of capital investments, profit and the flow of depreciation allowances in the process of circulation. An important part of the research was the technical and economical substantiation of the maximum ash content of produced coal based on establishing a quantitative relationship between this factor and the factors that are characteristic for the level of production cost at the resource estimation stage. It has been proved that the following parameters are the most sensitive to changes in the quality of coal: coal combustion temperatures, commercial product recovery ratio, cost of beneficiation, cost of mining. The equations that reflect how each of these parameters depends on the ash content of coal were used to determine weighted mean values of production cost for various ways of delivery of coal to the association's preparation plants. The maximum acceptable ash content was derived from the comparison of the obtained values of operating costs with the long-range marginal cost.

The insignificant residual cost of fixed capital (3 million rubles) at the mines in question is caused by the long term of their operation and the low volume of remaining resources.

Table 2.

1. Шахты	2. Отработка забалансовых запасов				7. Отработка балансовых запасов и закрытие шахт			
	3. Добыча	4. Пределъная зольность горной массы, %	5. Срок службы шахты, лет	6. Суммарные приведенные затраты, млн. руб.	8. Компенсирующая добыча, тыс. т	9. Срок службы шахты, лет	10. Суммарные приведенные затраты, млн. руб.	11. Остаточная стоимость освоенных фондов, тыс. руб.
12. «Червона зiрка»	1320/2670	53	24	60,8	2672	4	71,1	456
13. «Северная»	1500/2660	54	9	65,4	2413	4	76,1	731
14. «Объединенная»	1220/2580	49	25	62,1	643	8	69,8	235
15. «Миусская»	4020/2480	49	11	108,5	2314	7	112,8	797
16. «Снежинская»	1000/2890	50	7	71,8	2777	2	81,4	274
17. «Ремовская»	— /4250	47	12	62,3	4250	—	88,1	228
18. «Восход»	— /1339	44	3	22,8	1339	—	34,2	292
19. Итого				381,9	16408		533,5	3013

KEY:

1. Mines
2. Working of prime reserves
3. Production
4. Maximum ash content in rock mass, percent
5. Years of operation
6. Total adjusted production cost, millions of rubles
7. Mines are shut down upon exhaustion of balance reserves
8. Compensating production, thousands of tons
9. Years of operation
10. Total adjusted production cost, millions of rubles

11. Residual value of fixed capital, thousands of rubles
12. Chervona Zirka
13. Severnaya
14. Ob'yedinenennaya
15. Miusskaya
16. Snyezhnyanskaya
17. Removskaya
18. Voskhod
19. Total

NOTES: 1. Years of operation are given under condition that production capacity is maintained at current level.

2. Production from prime resources is shown in the numerator and that from substandard resources in the denominator.

Based on research results it is possible to make the following conclusions. An extension of the operational life of the discussed group of mines of the Torezantratsit Association, provided development of seams which are substandard in terms of their ash content and thickness is initiated, is much more efficient than shutting the mines down after their prime reserves are exhausted. Our calculations indicate that over 16 million tons of additional anthracite can be mined from the substandard reserves.

Mining of the substandard reserves at currently operating mines is feasible in the period when they have been practically stripped. This is because repeated access to them can prove to be economically inadventagous, and in some cases technically difficult to accomplish. When both prime and substandard resources are mined in combination, the ash content in coal remains below the maximum permissible level, which will make it possible to meet the required standards for quality when preparing anthracite at Torezanantratsit Association plants.

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COAL

SOCIALIST OBLIGATIONS FOR EXTRACTION GIVEN BY MINE

Moscow TRUD in Russian 28 Feb 85 (Special Insert No. 2) pp 2-3

[Article by O. Kuznetsov, director of TRUD for the section on socialist competition, under the rubric "Socialist Competition. More Fuel for the Country. In developing their traditional competition the five-hundred-thousand-ton miners' collectives are getting ready for a fitting celebration of the 40th anniversary of the Great Victory and the 50th anniversary of the Stakhanovite Movement, and to arrive at the 27th Party Congress with very high accomplishments in work": "Mining Prowess. An account of how the five-hundred-thousand-ton collectives met their obligations in 1984, and about the new 'Agreement of 105'"]

[Text] Aleksey Grigor'yevich Stakhanov was at the source of the five-hundred-thousand-ton movement. At any rate, the idea for this unmatched competition of prowess among the leading miners' collectives of brigades and sections belongs to him. The first five-hundred-thousand-ton records at the very end of the 60s were literally his inspiration. They say jokingly: leading miners' brigades have now been working everywhere in the mine.

"A record is a fine thing", said A. G. Stakhanov during a visit to him by our editorial personnel when the talk turned to the brilliant achievements of the Donetsk and Kuznetsk miners, and in particular to the phenomenal record of Ivan Ivanovich Strel'chenko. "But it is even better to repeat it. And then on a mass scale. That is a real movement. That is the way it should be."

How pleased Aleksey Grigor'yevich was with the first five-hundred-thousand-ton miners' contract which was concluded in December 1971 on the pages of TRUD. Sixteen leading brigades then decided to compete for an annual production of no less than 500,000 tons.

"That's the way we do it. That's the size of it!" Aleksey Grigor'yevich exclaimed on congratulating those participating in the contract."

And how he would have congratulated them today, when more than 100 miners' collectives are in the contest for these very high benchmarks.

In the fourth year of the five-year plan they have brought up 61.7 million tons of coal and 9.3 million tons of oil shale. This amounts to nearly one-fifth of the fuel mined at all of the country's working faces.

The winner of the five-hundred-thousand-ton competition is the Komsomol and Youth Communist Labor Brigade of holder of the USSR State Prize Vladimir Ivanovich Ignat'yev, from the Krasnolimanskaya Mine of the Krasno-armeyskugol' Association. The brigade fulfilled its annual supplemental plan 26 days in advance. On the eve of Miners' Day this advanced collective achieved a record daily output of coal by producing 12,013 tons.

In signing the new miners' contract for the final year of the five-year plan, V. I. Ignat'yev's brigade once more resolved to mine no less than a million tons of coal, and to work no less than two days on savings realized. The brigade has been true to its word: in January these advanced workers mined 87,500 tons of coal.

Among the "millionaires" are the collectives of Mikhail Pavlovich Chikh from the Rostov Mayskaya Mine, of Kirill Semenovich Markelov and Viktor Yakovlevich Frolov from the Gukovo Mines imeni 50th Anniversary of October and 60th Anniversary of the Komsomol, of Mikhail Nikolayevich Reshetnikov from the Kuznetsk Zyryanovskaya Mine, the leader of the five-hundred-thousand-ton competition in recent years, of Oleg Borisovich Bobrov from the Vorkuta Vorgashorskaya Mine, which was recently awarded the USSR State Prize, and of Valeriy Ivanovich Litvinov from the Karaganda Mine imeni Kostenko.

Completing the year on the top rung with a million tons of output were the brigades of A. Potapov of the Vorgashorskaya Mine, V. Gvozdev of the Raspadskaya Mine and N. Gladkikh of the Karaganda Shakhtinskaya Mine.

Hard-won, oh how difficult and hard-won is a miners' million! Year after year the work in the underground galleries gets more difficult, but talent, willpower and courage unfailingly carry the day. It would seem that there is no use in looking for a million tons from thin seams. But the brigade of twice Hero of Socialist Labor Mikhail Pavlovich Chikh, did it, with a truly brilliant victory.

Many miners' collectives have been cheered by shock work, record output and a strong finish just short of a million tons. The Kuznetsk brigades of V. Yelagin, V. Bovot, V. Vladimirov, V. Bardyshev and A. Chigintsev passed the six-hundred-thousand-ton mark and accomplished an over-plan growth in labor productivity of between 4 and 12 percent. In the Donbass a very high class of labor has been displayed by the collectives of G. Motsak, A. Polishchuk, N. Skrypnik, I. Manekin, A. Vashchilin, A. Lashek and V. Koval'chik. In the Pechorsk Basin the section of A. Potapov, holder of the Soviet Labor Union Prize imeni I. I. Brid'ko, has distinguished itself. It mined 972,000 tons of coal. Planned labor productivity was exceeded by 19.7 percent, and production cost per ton of coal was reduced by 11.8 percent.

In the Karaganda Basin the collectives of V. Shmakov and V. Turikovich each produced 800,000 tons of coal or more. The section of O. Ruff mined nearly 630,000 tons. For the first time in the entire history of the Moscow Basin three mining sections from the Moscow Mine alone, those of A. Titov, V. Shcherbinin and Yu. Yamnov, passed the half-million mark and mined 650,000, 580,000 and 550,000 tons of coal, respectively.

In a word, there is no shortage of examples of real shock work. But results could be even better. In fact, 19 parties to the contract did not reach the desired mark, and 37 collectives did not meet their commitments, and were four million tons of coal short.

These are bitter losses. They are dramatic not only for the shortfalls in tonnage, but also for the moral costs: people gave their word, embarked on a campaign for a very high output, and met with defeat. And the worst part is that it was not their fault. Once more they encountered errors in geological forecasting, improperly thought-out engineer solutions, a low level of plan and executive discipline, and shortages of spare parts.

Let's take a closer look at the reasons for the ridiculous malfunctions and breakdowns that occurred in the best mining collectives, which with a light heart gave their consent to the achievement of very high marks, and were left to the mercy of fate.

Because a stoping front in the Severokuzbassugol' Association was not ready, there was more than a month of downtime for the brigade of V. Ustyuzhanin of the Kuznetsk Pervomayskaya Mine (director A. Slyutin, labor union chairman S. Maksimov), which lost more than 40,000 tons of coal in shifting to another longwall, where the installation work was incomplete. At the same mine the brigade of V. Silin, having mined 422,000 tons of coal in 10 months, was actually on target for 500,000 tons. Once more, however, because the stoping front was not ready, the collective was idle for nearly three weeks, and lost out on a real chance to mine 500,000 tons of coal.

In May-June of last year a total of only 10,000 tons was mined by the brigade of A. Lin'kov of the Polysayevskaya Mine (director A. Filatov, labor union chairman G. Fadeyev) of the Leninskugol' Association. The reason for the breakdown: the lack for three months of a stoping front after completion of the next longwall. In November another blow fell: the conveyer line broke down. In all, only 336,000 tons were mined against commitments for 500,000.

A similar thing happened to the brigades of V. Zhukov and A. Kenig at the same mine.

What can be expected from this kind of labor organization and this attitude toward five-hundred-thousand men?

Let's go on to the brigade of N. Yemel'yanov of the Mine imeni Seventh of November (Leninskugol' Association), which had planned to mine a million tons of coal in 1984. Here is how it was "helped". A poorly timed shift from one longwall to another was made worse by the incomplete and late delivery of a new 2UKP-E mechanized unit, many components of which turned out to be not properly assembled and manufactured with many factory defects. The organization of labor and coal-cutting equipment at the new unit was not properly worked out or coordinated. A shortage of nearly 300,000 tons of coal — that was the price of the "engineer support" of the socialist commitments that had been made.

In this same Leninskugol' Association the brigade of V. Yelagin, after mining 764,000 tons of coal, and honorably meeting its commitments, was idle without a working face for 25 days in May of last year, and lost more than 50,000 tons of coal in the shift to a new longwall. This is typical. Year after year this association has not fulfilled the plan for opening up preparatory drifts. In 1984 the obligation was for more than 32 kilometers. In connection with this, the average number of operating working faces at 10 longwalls was below plan, and the line was almost 1,200 meters less than provided in the program.

The brigades of R. Stakheyev and M. Kurtukov of the Nagornaya Mine (Gidrougol' Association), although they also passed the half-million mark, did not fulfill the commitments they had made, and were 90,000 and 140,000 tons behind, respectively. The main reasons for not meeting the commitments were the high rate of breakdown of stoping machines and mechanisms, which was caused mainly by structural defects in the 4KM-130 unit, the unsatisfactory status of the drifts opened up to the longwall because of improper selection of their parameters and of the type of shoring, and illtimed preparation of the new longwall for M. Krutkov's brigade.

In the Gidrougol' Association (general director A. Gontov, labor union chairman I. Kravchenko) as a whole, five of the six parties to the Contract of 101 failed to carry out the commitments undertaken, and owe the national economy more than 430,000 tons of coal.

The serious shortcomings in the planning of mining operations at mines are rooted in the practice of adopting engineering solutions without a thorough analysis of geological and mining technology factors, and a lack of proper attention to the work of mine-tunneling brigades and sections on the part of association and mine managers, and as a result a systematic failure of the plan for opening up preparatory drifts has been the main cause for default in the obligations of the five-hundred-thousand collectives in the Karaganda Basin.

Last year at the mines of the Karagandaugol' Association (director N. Drizhd, territorial labor union chairman Zh. Ismagambetov) more than 30 kilometers of planned mine drifts were not opened up. As a result, the average number of operating working faces was 13 less than plan, and

the line of operating working faces was almost 2,000 meters less than what was provided for in the annual program. The results? Of the 16 collectives that were parties to the Contract, 12 did not fulfill their commitments, and they owe the national economy more than one million tons of coal, and of these, six did not reach the half-million mark.

The only explanation for such extraordinary occurrences as the six-months lack of a working face for the participating collective of V. Belik of the Mine imeni Gorbachev (director E. Rusak, labor union chairman T. Al'biyev) are poor attention of association, mine and territorial labor union managers to the dissemination of advanced experience; unsatisfactory, and at times simply irresponsible work in the engineer support for the plan and the socialist commitments of the workers' collectives; and serious shortcomings in planning the development of mining operations. The association and mine management, not having found the optimum solution for the simultaneous and efficient working of two adjacent seams, and not having prepared a standby working face, disbanded a section that had pledged to mine 500,000 tons of coal per year. Was this not the judgment of Solomon? But at heavy cost to the miners' shockwork.

The association and the territorial labor union committee were not deeply concerned about the status of mine-tunneling operations, have not given the brigades much practical aid by supplying them with equipment, spare parts or means of mechanizing heavy manual and labor-intensive operations, and have rarely introduced new and up-to-date systems of organizing labor.

These are the reasons for the serious losses mentioned above. But why should there be losses, where there should be only gains? Isn't it time that the sector staff and the managers of the production associations seriously applied themselves to the removal of these irritating blunders in the organization of the five-hundred-thousand competition, and to truly Stakhanovite work by the miners? And those who compromise this matter of state importance must be called to strict account without regard for title or rank. Today, on the eve of the 50th anniversary of the Stakhanovite Movement, this is the only way to put the question.

The party is promoting the mission of decisively doing everything that will worthily conclude the five-year plan and considerably increase the efficiency of production. "We must utilize to the full", Konstantin Ustinovich Chernenko has pointed out, "the mighty lever of socialist competition. Productive results depend to a large extent on how well it is organized in workers' collectives, what forms are chosen, and how competition is publicized." "We must in every way," K. U. Chernenko has emphasized, "develop workers' initiative, promote the adoption of supplementary plans, and see to it that the best conditions for highly productive labor are set up in every workers' collective."

The new miners' contract is a reply to the party's appeal to conclude the five-year plan worthily and to greet the 27th Party Congress with new labor achievements. In addition to the 500,000 and 1,000,000 marks, all 105 collectives have pledged to work no fewer than two days on savings realized. Labor productivity will be increased over plan, and production cost per ton of coal mined will decrease by no less than two percent. A large number of collectives have resolved to work no less than three or four days on savings realized, and to increase labor productivity 3-12 percent over plan. These high targets have been designated in honor of the 40th anniversary of the Great Victory and the 50th anniversary of the Stakhanovite Movement. This shows the miners' very high sense of duty and their truly communist attitude toward work.

Now the issue is to support the new miners' contract so that it will become a mass school of prowess.

This is up to the USSR Ministry of the Coal Industry and the Central Committee of the Labor Union of Coal Industry Workers. The continuation and the development of genuinely Stakhanovite traditions largely depends on how they do it.

These targets have been designated by the collectives of 105 brigades and sections that have entered into competition to mine 500,000 tons or more of coal (oil shale) in the final year of the five-year plan.

Chief of sector or brigade	Production association Mine	Pledge for 1985 (thou. tons)
-------------------------------	--------------------------------	---------------------------------

DONETSKUGOL'		
P. Negrutsa	imeni A. F. Zasyad'ko	927
I. Manekin	imeni A. F. Zasyad'ko	550
A. Polishchuk	Trudovskaya	500

MAKEYEVUGOL'		
G. Abramov	imeni 25th CPSU Congress	500

KRASNOARMEYSKUGOL'		
V. Ignat'yev	Krasnolimanskaya	1000
V. Kuznetsov	Krasnolimanskaya	520
A. Suprun	Rodinskaya	515
A. Lyashok	imeni Stakhanov	715

DOBROPOL'YEUGOL'		
V. Yerokhin	Belozerskaya	514

ROVEN'KIANTRATSIT		
G. Motsak	imeni Kosmonavty	510
N. Skrypnik	imeni Frunze	500
I. Filev	imeni Vakhrushev	500

SVERDLOVANTRATSIT		
V. Polishchuk	Krasnyy partizan	500
V. Koval'chik	imeni 60th Anniversary of the USSR	572

UKRZAPADUGOL'		
A. Akimov	No. 8 Velikomostovskaya-Komsomol'skaya	500
V. Rybinskiy	No. 3 Velikomostovskaya	500

VORKUTAUGOL'		
Yu. Bronnikov	Severnaya	605
M. Poleshchenko	Severnaya	500
P. Bogunov	Vorgashorskaya	650
A. Potapov	Vorgashorskaya	970
O. Bobrov	Vorgashorskaya	780
Ya. Nenartovich	Vorgashorskaya	540
A. Mel'nikov	Vorgashorskaya	550
S. Semenov	Vorgashorskaya	690
V. Sviridov	Vorgashorskaya	970
V. Shelud'ko	Vorkutinskaya	660
A. Borovoy	Komsomol'skaya	613
A. Shalupin	Komsomol'skaya	520
V. Burkov	Tsentral'naya	535
I. Sorochinskiy	Oktyabr'skaya	610
V. Baranov	Oktyabr'skaya	560

INTAUGOL'		
Ye. Vilimas	Intinskaya	625
Yu. Popov	Intinskaya	510
V. Buyanov	Kapital'naya	500
A. Zhaleyko	Zapadnaya	520

GUKOVUGOL'		
N. Gubin	Gukovskaya	500
V. Burdakov	imeni 60th Anniversary of the Komsomol	1000
V. Kuzmen'kov	imeni 60th Anniversary of the Komsomol	500
K. Markelov	imeni 50th Anniversary of October	1000

ROSTOVUGOL'		
M. Chikh	Mayskaya	750
L. Prokopov	Glubokaya	500

SEVROKUZBASUGOL'		
I. Safronov	Pervomayskaya	500

LENINSKUGOL'		
P. Maslennikov	imeni S. M. Kirov	550
N. Yemel'yanov	imeni 7th of November	720
N. Meshkov	imeni 7th of November	560
R. Putkov	Komsomolets	500
V. Yelagin	Oktyabr'skaya	600
Yu. Yesipov	Kuznetskaya	500
N. Grinev	Polysayevskaya	520

YUZH-KUZBASUGOL'		
M. Reshetnikov	Zyryanovskaya	700
V. Bovt	Zyryanovskaya	510
G. Bulenok	Zyryanovskaya	600
V. Bardyshev	Novokuznetskaya	600
V. Vladimirov	Abashevskaya	600
V. Ababkov	imeni 60th Anniversary of the USSR	500
A. Geyn	imeni V. I. Lenin	550
V. Kuznetsov	imeni V. I. Lenin	560
F. Bulatov	imeni V. I. Lenin	500
A. Yan'kin	Raspadskaya	500
V. Devyatko	Raspadskaya	700
P. Frolov	Raspadskaya	1000
Yu. Kobzev	Raspadskaya	600
V. Gvozdev	Raspadskaya	700
R. Shmidt	Baydayevskaya	500
B. Starunov	Kapital'naya	500
V. Chushkin	imeni 60th Anniversary of the USSR	525

GIDROUGOL'		
R. Stakheyev	Nagornaya	700
M. Kurtukov	Nagornaya	600
A. Karzhov	Inskaya	500
A. Vaganov	Yubileynaya	500

NOVOMOSKOVSKUGOL'		
A. Titov	Podmoskovnaya	510
V. Shcherbinin	Podmoskovnaya	510
A. Kochkin	Bel'kovskaya	500

KARAGANDAugOL'		
G. Anzimirov	Maykudunskaya	500
A. Vlaznev	Karagandinskaya	525
A. Romanyuta	Severnaya	510
V. Litvinov	imeni Kostenko	1015
O. Ruff	imeni Kostenko	815
V. Turikovich	imeni Kostenko	605
V. Shmakov	imeni Kostenko	770
Zh. Kozhakhmetov	imeni Gorbachev	500
V. Lisovskiy	imeni 50th Anniversary of the October Revolution	505
V. Korneyev	imeni V. I. Lenin	600
V. Marchenko	imeni T. Kuzembayev	500
A. Artishchev	Saranskaya	500
N. Gladkikh	Shakhtinskaya	805
V. Ishchenko	Tentekskaya	505
A. Shinguzhinov	Tentekskaya	505
P. Vasilev	Kirovskaya	500

ESTONSLANETS

V. Ivanov	Akhtme	600
V. Krupchenkov	Akhtme	600
A. Dem'yanov	Akhtme	500
V. Yakovlev	Viru	500
N. Pavlov	Viru	500
V. Kharchikov	Viru	500
I. Mitkevich	Tammiku	500
M. Balychenko	Estoniya	530
A. Peet	Estoniya	530
E. Paap	Estoniya	530
Kh. Kangur	Estoniya	500
V. Maslennikov	Estoniya	500
Kh. Kippar	Estoniya	530
Kh. Kuslap	Estoniya	500
V. Seyet	Estoniya	500

RSFSR MINISTRY OF THE FUEL INDUSTRY OBLKEMEROVOUGOL' ASSOCIATION

A. Chigintsev	Bol'shevik	650
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415

leading miners' brigades and sections mined 1,000 tons or more per day of fuel at the working face in the fourth year of the five-year plan.

98

collectives of miners' brigades and sections mined 500,000 tons or more of coal (oil shale) in the fourth year of the five-year plan with high productivity, and seven of them mined 1,000,000 or more tons of fuel.

61.7

million tons of coal and 9.3 million tons of oil shale were mined in the fourth year of the 11th Five-Year Plan by collectives of brigades and sections in conformity with the Contract of 101 which was concluded on the pages of TRUD. This amounts to nearly one-fifth of the total volume of fuel from the operating working faces of the sector as a whole.

750.5

million tons of coal and oil shale are to be mined in the final year of the 11th Five-Year Plan by the sector's miners.

105

leading collectives of miners' brigades and sections will be striving for high benchmarks of coal mining in the final year of the five-year plan, by concluding a new contract as five-hundred-thousand men.

COAL

SYNOPSIS OF ARTICLES IN UGOL' UKRAINY, 1984

Kiev UGOL' UKRAINY in Russian 1984, pp 47-48

UDC 621.31.213.34:622.232

PROSPECTS OF IMPROVEMENTS OF THE ELECTRICAL EQUIPMENT AND THE ELECTRIC POWER SUPPLY AT MINING COMPLEXES

[Synopsis of article by A.I. Parkhomenko, pp 1-3]

[Text] An analysis of current list of explosion-proof electrical equipment and power supply systems of mining complexes. New development and research, its preliminary evaluation. Proposals. 3 illustrations, 1 table.

UDC 622.01:658.387.61 "Shakhterskantratsit"

A COMPREHENSIVE APPROACH TO THE ENHANCEMENT OF PRODUCTION EFFICIENCY AND LABOR SAFETY MANAGEMENT AT THE SHAKHTERSKANTRATSIT ASSOCIATION

[Synopsis of article by V.D. Martovitskiy, pp 4-7]

[Text] A comprehensive approach to the enhancement of production efficiency and labor safety measures. Description of actions. 3 illustrations.

UDC 002.53:65.012.63 (658.386.6:622.3.013)

STUDY AND IMPLEMENTATION OF ADVANCED EXPERIENCE AT THE KIROVSKAYA MINE

[Synopsis of article by Yu.G. Pashchevskiy, pp 7-8]

[Text] Information support for specialists of the "Kirovskaya mine of the Donetskugol' Association as provided by ASNTIugol'. Results of implementation of new techniques at the mine.

UDC 622.833:622.268.6

MAINTENANCE OF DEVELOPMENT WORKINGS AT DEEP MINES IN THE WESTERN PART OF DONBASS

[Synopsis of article by R.F. Bulatov, N.T. Grishko, and V.A. Margolin, pp 9-10]

[Text] Results of mine studies of movements of wall rocks in development workings. Recommendations on efficient location, protection and maintenance of such workings. 1 table, 1 illustration.

UDC 622.831.2

EFFECT OF DEPTH ON GROUND SWELLING IN DEVELOPMENT WORKINGS

[Synopsis of article by V.P. Zubov, K.N. Lazchenko, and A.A. Ivanov, pp 13-14]

[Text] Results of mine studies of ground soil deformation in development workings at different depths in the mines of the Gukovugol' association. Conclusions, recommendations. 2 illustrations.

UDC 622.272.003.13

ECONOMIC SUBSTANTIATION FOR WORKING MARGINAL ANTHRACITE RESOURCES

[Synopsis of article by V.I. Malov and V.I. Salli, pp 15-16]

[Text] Economic evaluation of resources of coal seams considered substandard in terms of ash content and thickness. Optimal proportion of production from balance and marginal reserves, maximum permissible ash content in mined coal. 2 tables.

UDC 622.011+622.02

PRESERVATION OF THE NATURAL STATE OF ROCK MASS DURING TESTING

[Synopsis of article by Yu.A. Onischchenko, pp 11-12]

[Text] The significant influence of characteristics of state on rock mass parameters is demonstrated on the basis of the assumption of the theory of parameters of rock mass and experimental data. Recommendations to create a special discipline aimed at preservation of the natural state is within the physics of rock mass. 2 tables, 2 illustrations, 8 references.

UDC 622.2.014.2:658.012.2

SCHEDULING THE DEVELOPMENT OF MINING OPERATIONS FOR A COAL MINE

[Synopsis of article by N.V. Bakulin, pp 16-19]

[Text] A general design of a schedule for the development of mining operations. Formulas to calculate the indicators of the plan. 2 tables, 1 illustration.

UDC 622.273.131.001.5(045)

EVALUATION OF RECOVERY SECTION ELEMENTS AT A HYDRAULIC MINE

[Synopsis of article by I.M. Shenderovich, pp 19-20]

[Text] Methods of balanced correlation of load, height of stratum and other elements pertaining to the extraction section of a hydraulic mine under changing mining conditions in the coal seam. Formulas to calculate such elements are provided. 1 table.

UDC 622.7:622.74:658.26

REDUCTION OF POWER CONSUMPTION AT COAL PREPARATION PLANTS

[Synopsis of article by A.A. Zolotko, pp 20-22]

[Text] Reduction of power consumption of the main coal preparation processes by increasing the unit capacity of equipment now and in the future, for reducing power consumption for coal preparation, as well as other means. Conditions for increasing unit capacities of beneficiation plants. Directions for reducing power consumption in preparation of coal. 2 tables.

UDC 622.016.6-192

ENHANCEMENT OF RELIABILITY OF CUTTING SYSTEMS

[Synopsis of article by V.A. Narizhny, pp 22-23]

[Text] Results of analytical studies in the area of optimal enhancement of the availability factor of coal-cutting systems. 2 illustrations, 1 reference.

UDC 621.864:622

THE "ZLP" SAFETY WINCH

[Synopsis of article by A.R. Agranat, V.P. Olifir, and G.G. Petukhov, pp 23-24]

[Text] Description of the ZLP winch. Results of testing in mines. Virtues of the unit.

UDC 622.62-52:622.013

INFLUENCE OF AUTOMATION ON COAL PRODUCTION AND LOAD INCREASE RATES

[Synopsis of article by N.A. Mishchenko, pp 24-25]

[Text] Increasing cutting rate with a lGSh-68 continuous miner and intensification of production by using automated devices. Taking into

account the influence of coal resistance to cutting, thickness and pitch of the seam. 1 table.

UDC 622.28.634.848.1

USE OF MANIPULATORS IN MANUFACTURING OF PIT WOOD AT TIMBER YARDS OF COAL MINING ENTERPRISES

[Synopsis of article by V.A. Malashenko, A.V. Titov, and I.V. Turlay, pp 25-26]

[Text] Production of pit wood out of long-cut timber with manipulators developed for mine timber yards. 2 illustrations.

UDC 622.333:656.224.4 "Rodina Mine"

MODERNIZATION OF ROCK CARRYING COMPLEX AT THE RODINA MINE

[Synopsis of article by V.I. Prorochenko, V.F. Ovchinnikov, and Yu.I. Voldayev, pp 27-28]

[Text] An efficient method of increasing the rock carrying capacity during the rock cutting cycle at the Rodina Mine of the Pervomayskugol' association without great capital expenses. The method is intended for mines whose cage shafts cannot be sunk from the surface. 1 table.

UDC 621.317:722:622

ESTIMATING COMPENSATION OF REACTIVE POWER IN POWER GRIDS OF MINING ENTERPRISES

[Synopsis of article by B.S. Rogal'skiy and A.D. Golota, pp 28-30]

[Text] An efficient method of compensation of reactive power by plugging-in of condenser batteries right at the point of consumption. 3 references.

UDC 622.411.52.232.83

APU DUST COLLECTORS FOR THE FACES OF DEVELOPMENT WORKINGS

[Synopsis of article by A.D. Bondarenko, pp 30-33]

[Text] Description of the APU dust collectors, their characteristics and operational experience. 6 illustrations.

UDC 622.817.003.13(477.61/.62)

EXPENSES CAUSED BY MOVEMENT OF CAVITIES DUE TO GAS DYNAMICS PHENOMENA

[Synopsis of article by N.B. Parshikov, pp 33-34]

[Text] Additional expenses for eliminating the consequences of gas dynamics phenomena; evaluation of the efficiency of methods of cavity transfer. 1 reference.

UDC 621.39:522.81.001.2

SPARK SUPPRESSION IN ELECTRICAL CIRCUITS OF MINE BATTERY LIGHTS

[Synopsis of article by V.F. Sen'ko, B.A. Kuznetsov, N.B. Machugovskiy, and Ya.L. Krasik, pp 34-35]

[Text] A device to prevent dangerous spark formation if the light's cable is damaged in emergency situations both during standard light operation and during heating up of the lamp filament when turned on. 2 illustrations.

UDC 654.924.5:622.01

EXPLOSIVE METHOD OF POWDER FIRE EXTINGUISHING IN MINES

[Synopsis of article by V.D. Zakhmatov, pp 35-36]

[Text] Use of Pulsed firefighting in mines with explosive fire extinguishers. Evaluation of prospects of development of explosive powder fire extinguishing in mines.

UDC 622.25:69.026.233

SUSPENDED PLATFORMS FOR DRIVING AND SINKING SHAFTS

[Synopsis of article by Ye.I. Burda, pp 37-39]

[Text] Describes suspended driving platforms, both currently in use and new ones. The intensity and duration of installation and enhance safety. 2 illustrations.

UDC 622.257.122:624.138.41

CHEMICAL SUPPRESSION OF WATER LEAKS IN VERTICAL SHAFTS

[Synopsis of article by A.N. Chupika, L.G. Kalashnik, and N.I. Pereslavl'tsev, pp 39-41]

[Text] Use of chemical plugging solutions in the cage shaft of the Mospinskaya Mine of the Donetskugol' Association. 1 table, 3 illustrations.

UDC 681.5:622.284.74

DEVELOPMENT OF AN INDUSTRIAL ROBOT TO INSTALL ROOF BOLTS

[Synopsis of article by S.G. Smelyanets, A.N. Borovitskaya, I.P. Titov, and P.I. Tulub, pp 41-42]

[Text] Discussion of the possibility and advisability of developing an industrial robot to install roof bolts with binding cartridges. Ways to solve the presented problem. 3 illustrations.

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CSO: 1822/2-0

ALTERNATE FUELS

DETAILS ON EXPERIMENTAL MUTNOVSKIY GEOTHERMAL STATION

Moscow PRAVDA in Russian 23 Dec 84 p 6

[Article by I. Titov, PRAVDA correspondent in Petropavlovsk-Kamchatskiy: "Next Door to Volcanoes"]

[Text] Experimental steam production from a group of wells drilled at the foot of active Mutnovskiy Volcano has begun. Flowing all the producing wells simultaneously will enable specialists to obtain data on the field's production potential. These data are required for the designing and construction of a large geothermal power plant here.

Not so long ago, utilization of subsurface geothermal energy was discussed mostly in popular science magazines. It seemed that the conceptions of the engineers and scientists would only be realized in the unpredictably distant future. But the idea was too attractive to wait. It has already been put on a practical basis. Hot water from wells heats residential and industrial facilities, gives life to greenhouses and hothouses and fills swimming pools and health resort bathing pools. The first geothermal power plants have even been built.

National economic plans envisage further development of this new power source. Kamchatka, located in a volcanically active zone, will play a special role in these plans. The Pauzhetskaya Geothermal Power Plant here, the first in the country, has not only justified the concept but has become a unique scientific laboratory. With its assistance, hydrologists, designers, builders and operating personnel have obtained answers to many important questions. Experience gained here will contribute to the solution of a more complex task: harnessing the Mutnovskiy geothermal region, located in the mountains 130 kilometers from Petropavlovsk. The Kamchatka Hydrogeological Expedition of the Sakhalingeologiya Association is carrying on exploratory operations there.

"Research is confirming the geologists' original conclusions," says Expedition Director G.M. Asaulov. "It is indeed a huge field. Its potential is far from being established, but it is already clear that this great power source can supply the turbines of a future generating plant practically indefinitely. Delivery of this energy in the amounts required is only a matter of time.

All active volcanoes have enormous thermal energy. But not every volcano has energy which lends itself to being harnessed. What conditions set the Mutnovskiy Volcano apart from others? First of all, structural geological features.

And a factor that might seem somewhat unexpected: the local climate. All this is easily explained. A thermal medium is required to obtain energy from the volcano: water. Enormous amounts of water from the bowels of the earth must be constantly replenished. The environs of Mutnovskiy Volcano have highly favorable watershed features. The area has deep basins with no outlets, cup-shaped valleys and high mountain plateaus. Precipitation does not all run off into the sea via streams and rivers. Much of the water sinks four or five kilometers into the earth, where it becomes superheated steam. In the Mutnovskiy field, an average of two metric tons of water falls on each square meter of surface area. And area is not measured here in hectares, but in square kilometers.

But it is no simple matter to wrest these riches from nature. Many barriers stand in man's way: high mountains, snow, winds, freezing temperatures, no roads, etc.

I was able to be in the high mountain valley near the volcano at different times of the year. In the summer, the valley rejoices: the mountainsides around the drilling camp turn green. It is calm and quiet. The sun scorches just as it does in the south. Plumes of steam over cracks in the earth's crust are barely visible against the green background, quickly dispersing in the heated air. In secluded areas at this time of the year, the blueberries and crowberries are bursting with juice. Fortunate mushroom gatherers find armillaria. You think, "What a nice little spot!" It was not for nothing that one of the first persons to pass this way named it "Dachnyy" ("Summer Home").

Now from the crest of the ridge in the wintertime I look for the places I know, looking for the landmarks, and they are not there. Below me is a hollow in the Arctic cold, windswept and buried under the snow. And plumes of steam everywhere. It was as if dozens of giant steam locomotives had been gathered here from somewhere and they were simultaneously blowing off steam from their boilers. Thick, milky-white clouds of steam floated up steeply, slowly spreading out, dispersing and blending in with the clouds. What a fantastic picture!

I look around more attentively. And immediately I think to myself, "There are more drilling derricks." They are visible not only down below, in the hollow, but also on the gently sloping hillsides and along the deep ravines.

"Several new wells have been drilled," Grigoriy Mikhaylovich Asaulov explains, "but the number of wells is not the point. In the summer, we began using heavy-duty oilwell drilling rigs. They not only drill deeper, but in such a way that the wells can be both exploratory and producing wells."

It was necessary to deal with great difficulties. The Kamchatkan drillers were not experienced with the new, heavy-duty rigs. And the foremen assigned from Sakhalin had never lived in such severe conditions as those at Mutnovka. The whole organization of drilling services had to be changed. Following the example of western Siberian oilfield workers, we switched to shifts. We used helicopters or buses built at the Urals Heavy Tractor Plant to move personnel in for a two-week shift. Then we rotated them....

Drillers started to spend more time with their families at the expedition camp

in the famous Paratunok Valley. These trips did not come cheap. But labor productivity rose considerably, and the workers' humor even improved. Now everyone is convinced that this is the only correct way to organize operations in the high mountains of Kamchatka.

The new rigs have already drilled two deep wells. Two others are being drilled. A special detachment headed by A.M. Kharitonov was set up to evaluate the wells.

Aleksandr Mikhaylovich is a graduate of the Novocherkassk Geological Exploration Technical School. He has four years of basic field experience here. Young, take-charge prospectors familiar with local conditions were selected for the detachment. Viktor Gorbachev was a driller until just recently, and Anatoliy Serdyuk is an assistant drilling foreman. Others are highly experienced, too.

"We are gladly undertaking something new," says A. Kharitonov, "but we are very excited. We have a great responsibility! The outcome of the entire expedition depends on our conscientiousness and skill in performing research. It is desired that each new well be at least as productive as No. 26."

Well No. 26 has been the most productive here so far. It produces 80 metric tons of steam per hour. Wellhead temperature is 230°C. Calculations indicate that five or six wells like this could totally supply the first phase of the future 50-megawatt geothermal plant.

Nature carefully hid her treasures in the mountains. Freezing cold and snow stand watch over them. Hardest of all to take are the cutting winds, commonly reaching hurricane force at elevations of around 1,000 meters.

"Toward spring, the expedition's mobile homes and camp buildings are buried deep in snowdrifts, like partridges," the drillers recount. "People on foot make paths through the frozen snow crust on the roofs. Last winter there were very heavy snows. It complicated progress even further. When we cleared off the work site for a new rig, we had to keep removing so much snow that a four-story building could have fit easily into the cleared area. Even a canyon over 50 meters deep was filled to the top with snow. Someone crossed over to the other side on this "devil's bridge."

But no difficulties or unexpected problems posed by the weather can stop man. He has a clear goal: complete a working evaluation of the field's reserves and submitted documented proof by the end of 1986. It is to be hoped that Mutnovka will live up to hopes and turn out to be a reliable source of energy for the industrial development of Kamchatka.

8844

CSO: 1822/220

ALTERNATE FUELS

KAZAKH GEOTHERMAL ENERGY SOURCES

[Editorial Report] Alma-Ata MADENIYET ZHANE TURMYS in Kazakh No 1, January carries on pages 1-2 a 1,300-word article by Professor and KaSSR State Prize Laureate Zhurimbek Sydyqov, corresponding member of the KaSSR Academy of Sciences, published under the rubric "Let Us Carry out the Decisions of the October Plenum," entitled "Subterranean Riches." The article outlines KaSSR subterranean water resources and their great importance for many areas of the republic's economy and life.

Sydyqov includes in his discussion information not only on the potential usefulness of subterranean waters in the republic for agriculture. (As much as 40-60 billion cubic meters a year could be taken from such sources, but current use of subterranean waters in the republic comprises only 10 percent of all use, including non-agricultural. Total resources are put at 7,500 cubic kilometers.) And for their medicinal properties, but also an outline of subterranean waters as sources of geothermal energy as well. According to Sydyqov, as much as 2 billion cubic meters of waters heated below the surface naturally to temperatures of from 40-170° C could be used in the republic's economy each year to provide energy equivalent to that obtained from burning 14-15 million tons of coal.

Sydyqov also notes in his discussion possibilities for extracting rare minerals and salts from subterranean waters. In the beginning of his article, Sydyqov stresses that development of KaSSR subterranean water resources will be needed even if the Siberian canal is built since it will solve some regional water problems.

CSO: 1832/403

ALTERNATE FUELS

BRIEFS

SOLAR POWER PLANT--The first large solar power plant in the USSR, rated at 300,000 kilowatts, will be built in the Kyzylkum Desert near the Tuyamyunskoye Reservoir on the Amudar'ye. The engineering and economic project for the plant was developed by specialists at the Central Asian Department of the All-Union Atomteploelektroproyekt Institute. [By G. Dimov, IZVESTIYA correspondent in Tashkent, published in CURRENT DIGEST 6 Mar 85: "300,000-Kilowatt 'Sunbeams'"] [Excerpt] [Moscow IZVESTIYA in Russian 10 Feb 85 p 1] 8844

GARBAGE AS FUEL--The tin can arched smashingly between the goal posts: it's a goal! "Hurrah!" the rapturous fans shouted. "Well, well," said technicians at the Solid Waste Laboratory of the All-Union Reusable Materials Engineering, Designing and Construction Institute. That tin can is valuable. Its inside is plated with tin, a non-ferrous metal in great demand. Tin dependably prevents the "Tourist's Breakfast" or spiced sprats in tomato sauce from spoiling. Now the sprats have been eaten and the valuable tin can is quickly washed. Lab technicians asked whether this is practical. And they came up with a "double-decked sifter." Two metal screens sift through garbage, sorting out tin cans. Not for nothing do the experts call garbage "urban ore." Sometimes one finds grains of "gold" in trash. What is this? The chief of the Solid Waste Laboratory, L. Shubov, is holding an odd briquette, one that looks like varicolored confetti stuck together. Some new-fangled New Year's noisemaker? Far from it: it is a fuel briquette made of waste paper cut. In layman's terms, the scientists invented a pneumatic separator, which, like the nightingale robber, blows paper, scraps of cloth and polymer film out of mounds of garbage. We separate out the film and the residuals are processed. And instead of coal or firewood, varicolored fuel briquettes are delivered to wooden-frame homes. [By A. Kiseleva] [Text] [Moscow KOMSOMOL'SKAYA PRAVDA in Russian 2 Feb 85 p 4] 8844

SECOND KAMCHATKA GEOTHERMAL PLANT--Petropavlovsk-Kamchatskiy--Design work on a new geothermal generating plant in Kamchatka has begun. The plant will be built 70 km from the oblast' capital to take advantage of the huge Mutnovskiy geothermal field on the peninsula. Its reserves are virtually inexhaustible. Only drillers and geologists are presently working at the severe and inhospitable site, where the winter snowfall can be seven meters. They are in the final stages of exploration of the field. With the arrival of spring, construction of living quarters and a road will get underway. The new geothermal plant will have a capacity several times greater than the first Soviet geothermal plant,

which was built twenty years ago in Kamchatka. The utilization of geothermal energy is a promising trend in the development of the power industry in Kamchatka. [By PRAVDA stringer V. Korotkikh] [Text] Moscow PRAVDA in Russian 4 Feb 85 p 1] 8844

CSO: 1822/220

NUCLEAR POWER

AES CONSTRUCTION, SUPPLY PROBLEMS CITED

Moscow MATERIAL'NO-TEKHNICHESKOYE SNABZHENIYE in Russian No 12, Dec 84 pp 62-65

[Article by E. Pozdyshev, deputy chief of the Soyuzglavatomenergo [All-Union Main Administration for Atomic Energy Use] All-Union Production Association: "Achievement of a High Growth Rate for Nuclear Power Engineering", under the rubric, "In Nuclear Power Plant Construction"]

[Text] In the decisions of the 26th CPSU Congress, it was emphasized that the development of heavy industry is an unconditional prerequisite to solving all our national economic problems--both production and social. This is particularly important with regard to heavy industry's basic sectors, primarily those in the realm of fuel and power production. Bringing improvements into the structure of the power production balance takes on special urgency, as does reducing the share of petroleum, especially as used for fuel. For this purpose, nuclear power production should undergo more rapid development. In the overall development of electric power production, a large share of it will have to be produced with nuclear fuel. This idea has also been reflected in the basic tenets of the Power Program.

In the two decades which have passed since the first large-scale industrial power blocks were started up at the Novo-Voronezhskaya and Beloyarskaya nuclear power plants, a great deal of experience has been accumulated in this country in planning, constructing and operating these AES's. At the present time, their installed capacity has exceeded 21 million kW.

It was envisaged, during the 11th Five-Year Plan period, to put more than 20 million kW of new AES capacities on stream. Realization of such plans requires clear-cut interaction and reliable coordination in the activity of many sectors, and requires a great number of planning, scientific-research, designing, installation and supply and sales organizations.

Summing up the work completed during the four years of the five-year plan which have just passed, it can be safely said that the power station builders and their partners in AES construction have done quite well. In this year alone, of the facilities which we have in operation, the first power block at the Kalininskaya Electric Power Station and the 4th power block at the Kolskaya station have both been put in operation, and the first power block at the Zaporozhye AES is undergoing start-up tests. Construction and installation work is drawing to a close and preparations are being made to start up power blocks at the Smolenskaya, Balakovskaya and Yuzhno-Ukrainskaya stations.

The collectives working on construction of the Zaporozhskaya and Balakovskaya AES's deserve special mention. Competing with each other, they have, year in and year out, achieved new gains in production. A substantial reserve has been created at both of these facilities, which is allowing power blocks having million-kW unit capacities to be brought smoothly into operation. At the Balakovskaya AES, as an example, labor productivity has increased by 23 percent during the last three years of the current five-year plan period. The output per worker on construction of the second block of the Zaporozhskaya AES has increased by 46 percent compared to work on the first block.

The scientific research and planning organizations have made an enormous contribution to the power plant builders' achievement. Among other things, they developed a standardized plan for AES's equipped with water-moderated, water-cooled reactors, of earthquake-resistant construction. The plan uses building structures which have a high degree of plant readiness, thus allowing the use of industrial construction methods. The use of new progressive designs greatly reduces the labor intensiveness of the operation as well as the expenditure of material resources.

Workers' settlements are being built hand in hand with construction of the basic AES facilities. Every year sees hundreds of thousands of square meters of living space turned over for occupancy. At present, there are 500,000 people living in well-planned quarters. The necessary social and cultural institutions, as well as athletic facilities are available to serve them. Every year sees improvements in the power engineering workers' way of life.

A great amount of emphasis is being placed on the training of operational personnel. Academic training centers, equipped with special training simulators, have been set up for this purpose. In addition to the new specialists, the skills of personnel from operating power stations are periodically improved here.

Major measures are being carried out to increase the capacities of the machine-building enterprises which produce AES equipment. Special time and effort have been set aside in order to complete construction on the Atomash [Atomic Machine-Building Association] Production Association's facilities, and to expand a number of the leading nuclear machine-building plants.

In short, the fourth year of the present five-year plan period saw the achievement of quite good results in nuclear power production growth. However, there are also some leftover unresolved problems, and not all assignments were completed within their set deadlines. There were cases of lagging in the development and manufacture of individual types of equipment, in the preparation of planning estimates and design documents, and in the carrying out of construction and installation work at some of the facilities.

Intra-shift work stoppages are causing concern. They give rise to anxiety on construction sites, and reduce labor productivity. As a rule, these work stoppages bring about accident situations during a duty shift when the workers try to make up for lost time, and to keep within the timetable for construction and installation work. And this has a negative effect on the quality of their work performance.

The guilty ones here are mainly the construction organization directors, who are sometimes sluggish in their decision-making, and who are incapable of dealing correctly with available material and labor resources. At the same time, it cannot go unmentioned that half of all the intra-shift work stoppages are caused by shortages in material and technical supply. I have had many occasions to be present during the construction of a number of nuclear power plants. And often, in response to the question of why one or another brigade was standing idle, have heard the answer: "There are no materials."

Unfortunately, the supply enterprises quite often let the power station builders down. A great number of examples can be cited where the suppliers ship their products late, and do not send them in the required assortments. For example, the Chelyabinsk and "Krasny Oktyabr'" (in Volgograd) metallurgical works, and the Nikopol Southern Pipe Plant imeni 50th Anniversary of the Great October Socialist Revolution, are constantly in arrears. And deliveries of rolled metal stock to nuclear power station construction projects and to nuclear machine-building plants are often disrupted by other USSR Minchermet [Ministry of Ferrous Metallurgy] enterprises.

All this is quite well known to the ministry, which has, on more than one occasion been criticized during the operational conferences held by the deputy chairman of USSR Gosstab. However, the requisite measures by which all the enterprises would stringently observe delivery discipline, have not been taken at this time.

Some of the guilt lies at the doorsteps of USSR Gosstab's territorial agencies, whose sphere of influence includes the suppliers. It is difficult to say what is guiding these agencies, when they seem to relate so blissfully to the fact that month after month, and year in and year out, the enterprises fail to execute their contractual obligations. In the CPSU Central Committee and USSR Council of Ministers decree on strengthening discipline with regard to deliveries, it was emphasized that non-completion of product deliveries must be counted as a serious breach of planning and state discipline.

Let's take that same Volgograd "Krasny Oktyabr'" Plant as an example. The disruptions in deliveries of their products, which this plant tolerates, are causing turmoil at the construction sites of nuclear power stations. However, the Nizhne-Volzhskiy Main Territorial Administration is taking no effective measures to correct the situation. Meanwhile, this administration has, as do other USSR Gosstab agencies, effective means by which to influence the negligent suppliers.

Considerable deficiencies in the provision of AES construction projects with material resources are being permitted by the main administrations which supply and market materials and equipment. Some of them are not observing the proper sequence in officially registering their job authorizations, by handing them over in groups with no differentiating bands or any indicators of purpose. The enterprises treat these job authorizations as they would any other and do not hurry particularly to fill the orders. Soyuzglavkabel' [All-Union Main Administration for Supply and Sale of Cable Products (attached to USSR Gosstab)], Soyuzglavarmatura [All-Union Main Administration for the Delivery of

Fittings] and Soyuzglavelektro [All-Union Main Administration for the Supply and Sale of Electrical Equipment Products (attached to USSR Gosnab)] are also guilty of not meeting the deadlines for making out schedule orders for AES's which are being started up.

In this last year of the 11th Five-Year Plan period, all the power production workers' effort are going to be directed toward unconditionally carrying out the decisions of the 26th CPSU Congress which are concerned with the development of nuclear power production. Efforts to develop fast neutron reactors will be continued, as will efforts to use nuclear fuel in the production of thermal power. Among other things, a massive volume of construction and installation work is to be carried out on the construction of the first nuclear heat supply plants in our country, near Gorkiy and Voronezh.

Still greater prospects will be opening up during the 12th Five-Year Plan period. In comparison with the present five-year plan period, new capacities being put into operation will double. The yearly volume of construction and installation work will exceed two billion rubles. As a result of industrializing and mechanizing the production process, increasing the available power, introducing flow-line production methods, cost accounting, the integral process brigade contract and the section contract [uchastkovyy podryad], it is assumed that labor productivity will increase 1.5-fold.

The problems of improving quality in construction operations and equipment installation must be solved during the 12th Five-Year Plan period. It is common knowledge that operational personnel have been levelling many complaints about the quality of the very facilities which are now under construction. This is the reason USSR Minenergo needs to develop an integrated program to solve this problem. Special emphasis must be placed on improving the quality of designs and materials used in construction. In fact, this is exactly where one finds one of the elements relating to the reliability and long service life of future AES's.

There are also plans being laid on for an extensive social program. There are plans to make no less than a million square meters of living space available every year in the settlements being built for the power station construction workers and operational personnel. There are plans to build new schools, stores, kindergartens, polyclinics, motion picture theaters and other cultural and personal facilities. What are settlements today are destined to turn into modern cities, where the inhabitants have everything they need for life and leisure.

Realization of the projected plans requires the resolute elimination of the shortages in material and technical supply which are now hindering the power station construction workers. And we cannot manage in this area without the help of USSR Gosplan, USSR Gosnab, and the other ministries and departments.

The decree issued by the CPSU Central Committee and the USSR Council of Ministers "Improving the Planning, Organization and Administration of Capital Construction" requires that there be a balancing out of the limits on capital

investments and construction-installation work with the financial and material resources. Unfortunately, there is as yet no empirical evidence of this balance. As a rule, the planning agencies allocate smaller quantities of materials than are required to assimilate the capital investments.

Here is just one example. This year, Soyuztsentratomenergostroy [possibly All-Union Central Nuclear Power Station Construction Association] was allocated 157 million rubles according to plan. However, they were undersupplied with cement, which they need for their installation work, by 10 million rubles' worth. The year, it can be safely said, is already over, and all the association's efforts to obtain the cement they need have turned out to be futile. And the situation is identical with regard to certain other materials.

We do understand that the country's resources are not unlimited. And there are workers from other sectors of the national economy, in addition to power station builders, who also have need of them. That is why it is all the more needful that monies allocated for construction of one or another facility be coordinated with material and equipment allocations. This is the only way we can ever fulfill our plans successfully.

There is another important problem, and the fulfillment of the 12th Five-Year Plan depends on our finding a solution to it. It is a question of striking a balance between the material resources and the construction-installation organizations' capacities throughout the ministry as a whole, as well as within the territorial cross-section, so that the construction of nuclear power production facilities can be carried out in compliance with the norms for construction time. At present, no such system is in existence.

At the present time, over 80 percent of materials and building structures are being sent to underway projects, and only the negligible leftovers are sent to the other projects. The upshot is that some construction organizations, working under great stress, do not make full use of the resources allocated to them, and others suffer because of a shortage of these resources, and are unable to create a reserve as planned, even though they have the capacity needed to accomplish this.

In our view, we cannot enter into the 12th Five-Year Plan period without a solution to the problem of proper distribution of material resources among the construction organizations according to their capacities. And the final say in this matter belongs to USSR Gosplan and USSR Gossnab, as well as to our ministry.

I would like to say a few words about the norms. As is generally known, they were established 10-15 years ago, reckoned on the basis of a million rubles' worth of construction-installation work. But a lot has changed since that time. The use of industrial methods of constructing projects has been further developed. The requirements for durability in AES facilities have been made stricter. That is why the norms for material outlays which presently exist have long been obsolete. They need to be reviewed, with the idea of increasing them. This is no idle whim, nor merely a desire to obtain the greatest poss-

ible quantity of resources, but an objective necessity, which has its source in the problems the power facility builders have to resolve during the next five-year plan period.

It should be emphasized that the above-named problems are already in need of a solution, and should not be shelved. There is quite a lot that can be done during the upcoming year to insure that the 12th Five-Year Plan period starts off with no breaks in continuity. We hope that USSR Gosplan, USSR Gossnab and the other directive agencies will take all needed measures to eliminate the shortages which now exist in material and technical supplies to nuclear power station construction projects. In doing so, a reliable foundation will be created, upon which to build the further successful development of nuclear power engineering.

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NUCLEAR POWER

DELAYS AT BALAKOVO AES CONSTRUCTION

Moscow PRAVDA in Russian 24 Feb 85 p 3

[Article by A. Vorotnikov, PRAVDA correspondent: "The Balakovskaya Nuclear Power Station" under the rubric "After a Line From the Decisions of the 26th CPSU Congress"]

[Excerpts] Putting the capacities into operation...at the Balakovskaya AES".

(From the Basic Directions for the Economic and Social Development of the USSR for 1981-1985, and the period up to 1990).

Balakovo (Saratovskaya Oblast)--I have had to come here on more than one occasion. This construction project has literally grown before my eyes. Often you could hear the question, "Why did they decide to put the power station right here?" The first person they asked was A. Maksakov, who is the director of SaratovGESstrov [Saratov Hydroelectric Power Station Construction Administration]. "We have here major construction and installation organizations, precast ferroconcrete plants and woodworking enterprises," he explained. Their collectives have taken shape only after many years. In fact, we were the ones who set up the Saratovskaya Hydroelectric Station, the irrigation and water-supply canal, and the chemical facilities. And last, and most important, we organized the successful arrangement of the city itself. It lies on the crossroads of the transport arteries--the Volga, the rail line and a motor vehicle route. We already have a thermal electric power station and a GES [hydroelectric power station] presently in operation, and after the nuclear power station and the hydroelectric pumped storage power station are constructed, this complex's capacity will reach 10 million kilowatts.

For the last few days, 400,000 rubles' worth of work have been completed every day at the nuclear power plant construction site, which is twice as much as for the same period last year. By the way, we have never had a single year at this project, in which the workers failed to overfulfill the plan.

Several dozen facilities have already been put into operation, including a block of auxiliary administrative and combined buildings, a pumping station, and an outdoor switchgear. And many others are nearing completion. But the main objective--putting the first million-kW unit into operation prior to the end of last year--was not accomplished. The start-up was postponed. Why?

This topic was discussed in detail at a meeting of the party gorkom bureau. The criticism was directed primarily at the leading subcontracting organizations--the Balakovo administration of the Volgoenergmontazh [Volga Power Station Equipment Installation] Trust, where Yu. Goryashchenko is the director, at Gidromontazh [State Construction and Installation Administration of Glavgidroenergostroy (Main Administration for the Construction and Installation of Hydroelectric Power Plants in the Central and Southern Regions)], which is managed by A. Ptitsyn, and at a Promstroy [Industrial Construction Administration] section headed by A. Ivanov. They had been relying on end-of-the-month storming to get them through, but they miscalculated. Their lagging caused interruptions in the subcontractors' work. But even though the construction project party committee and the Balakovo gorkom adopted some "excellent" resolutions to speed up the work, the needed results were not always achieved.

The fate of this construction project has depended, in great measure, on the USSR Ministry of Power and Electrification. Employees of this ministry have visited the Balakovskaya AES more than once. They have seen with their own eyes that the expected smoothness of construction has not been achieved, and that there is a shortage of specialists on the site. But the ministry authorities have gone their way, and almost everything has remained as it was before.

Sometimes disruptions are caused by the fault of the planners. The technical documentation for the AES was done by the Kharkov, Gorkovskiy and other divisions of the Atomteploeletkroproyekt [Nuclear Heat and Electric Power Station Planning] Institute. This documentation arrived late, was incomplete, and had mistakes. Thus, individual sheets of the plan for the machine room framework were changed six times, and the service platform plans for the turbo-generator set were changed five times.

Some of the structures were disassembled and altered. Hundreds of additional openings, which had been "forgotten" in the design plans and specifications, had to be made in the altered cross-section.

And, as I have been told at the construction site, the matter has not been made right in all aspects. The blueprints for the second start-up complex come in, and as before, they are late and incomplete. A portion of them are distributed bearing mistakes which showed up as far back as when the first million-kW turbine was being built. For example, the documents relating to the electrical system and the ventilation of the main building has not been changed. There are about 200 people who are constantly correcting the planners' defective work.

Equipment deliveries are also in a fever. This includes deliveries from Atom-mash, and the Kurgan and Novgorod fittings plants. The problem of the "suspension" of still newer and newer non-power-producing facilities at SaratovGES-stroy is of no little importance. Their total cost comes to over 300 million rubles. It is going to be very difficult for the power station builders to put the nuclear power station's four blocks into operation during the next five-year plan period with this program of "nonspecialized" facilities.

Moreover, the workers of Balakovo think that it is time (according to the experience of other electric power stations) to simultaneously erect electric power transmission lines, so that the power produced by the power station can be immediately turned into the country's power system. In the meantime, the problem of distributing the power from the 2nd block, for example, goes unresolved. And it is no simple task to erect an LEP-500 [500 kV power transmission line] in one year.

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NON-NUCLEAR POWER

UKRAINE UHV, OTHER POWER EQUIPMENT PRODUCTION

Kiev EKONOMIKA SOVETSKOY UKRAINY in Russian No 1, Jan 85 pp 65-69

[Article by S. Osmolovskiy: "Developing the Technical Base for Electrification in the Ukrainian SSR", under the rubric "From the History of the National Economy"]

[Excerpts] The most important link in the structure of the Soviet electrical engineering industry is the Ukrainian SSR's electrical engineering industry, which plays a substantial role, both in the development of large-scale power production, and in the electrification of a number of industrial, agricultural and transport sectors. At present, this industry's share of union-wide production of large electrical machines comes to 24.7 percent, 16.5 percent of turbogenerator and steam generator production, 26.3 percent of electric motors of up to 100 KW output, and 46.1 percent of power transformer production*.

The UkSSR electrical engineering industry occupies a critical position with regard to the technical maintenance of the national economy's widespread program of electrification during the 11th Five-Year Plan period. Production of superpowerful generators for nuclear, thermal and hydroelectric power stations is increasing at outstripping rates, as is production of power transformers, electrothermal and welding equipment, new types of high-voltage equipment and converters. The power transformer, which has a capacity of 1,250,000 KW·A at 330 KV, which was developed at the ZTZ [Zaporozhye Transformer plant], signifies a qualitatively new stage in the development of Soviet power engineering. Specialists of the Explosion Safety Devices Scientific Production Lecturer's Association have started manufacturing new combinations of mining equipment designed for an increased tension of 1,140 V, instead of the traditional 660 V. This has helped to increase the daily coal recovery total in the section by some 1.5--2-fold. The problem of setting up the first complex to produce high-voltage electrical equipment for the superpowerful Ekibastuz-Tsentr and Ekibastuz-Ural power transmission lines has been solved. These lines will transmit 1,500 kV of direct current and

*"Narodnoye khozyaystvo SSSR v 1982 g." [The National Economy of the USSR in 1982], p 153. "Narodnoye khozyaystvo Ukrainskoy SSR v 1982 g." [The National Economy of the Ukrainian SSR in 1982], p 102.

1150 kV of alternating current, thus providing the most economical method of transmitting electric power over long distances.

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NON-NUCLEAR POWER

FEBRUARY ENERGY DEMAND EXCEEDS LIMITS IN CERTAIN PLACES

Moscow EKONOMICHESKAYA GAZETA in Russian No 8, Feb 85 p 3

[Article by V. Loginov: "February's Totals for Resource Utilization"]

[Text] ELECTRIC POWER

Totals for the first half of February are attesting to the fact that the work, being done in our country to strengthen discipline with regard to the use of fuel and energy resources, is being stirred up.

Everywhere, including the oblasts, cities and rayons, and in ministries and enterprises, headquarters personnel and operations groups and commissions attached to ispolkoms of local Soviets are at work making daily checks to see that assigned limits on power usage are observed.

Severe limits are being placed on allocations to directors found guilty of overexpenditures of power.

According to operational data, the overall consumption of electric power for the first ten days of this month has been reduced by more than a percent against the plan. This is quite a bit, when we consider that the average ambient air temperature turned out to be lower than normal.

On the whole, the demand for electric power from 10 of the union republics' enterprises fell within the established limits. But in the Ukraine, in Lithuania, Latvia, Estonia and the Kirghiz SSR, as well as in the Perm, Kirov, Omsk and certain other oblasts, overconsumption was tolerated.

The measures being taken locally to reduce consumption during morning and evening peak load hours play quite an important role in guaranteeing a steady power supply. Unfortunately, these measures, at their present level, are not meeting the required demand.

Thus, on 14 February, the required capacity was available in only three of the Center's 17 power systems during the morning peak load hours. In the remainder of the power systems, the capacity exceeded the established level by over 600,000 kilowatts. Power engineers finding themselves in similar situations will have to limit the power consumption of individual enterprises beforehand. And as a rule, this will include some of the larger enterprises.

This situation can be avoided only when all electric power consumers, without exception, strictly observe the mode of operation assigned them by the power systems.

Overexpenditure of power is still being tolerated, for the most part by small enterprises. During the first ten days of February, according to information from USSR Minenergo, they exceeded their limit by over 250 million kW/hours. Power allocated to the general public during this time exceeded the planned level by 46 million kW/hours.

It should be mentioned that all the industrial ministries are by and large within their limits, although there are enterprises within some of them which are violating plan discipline. For example, Mingazprom [Ministry of the Gas Industry] has 13 such enterprises, USSR Mintsvetmet [Ministry of Nonferrous Metallurgy] and Minavtoprom [Ministry of the Automotive Industry] each have 11, and Minkhimprom [Ministry of the Chemical Industry] has 5.

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NON-NUCLEAR POWER

CONSTRUCTION OF SECOND SURGUT GRES DESCRIBED

Moscow EKONOMICHESKAYA GAZETA in Russian No 10, Mar 85 p 18

[Article by G. Shalmanov: "The Surgutskaya GRES-2", under the rubric "Construction Projects in Progress--1985"]

[Text] North of the Western Siberian oil and gas complex the Surgutskaya GRES-1, [State Regional Electric Power Station], which has a capacity of 3.3 million kilowatts, is already operating. A second GRES is presently under construction here. It is a prototype of its kind for future large-scale power plants to be built at Nizhnevartovsk, Urengoy and Nyagansk.

The plan for the new GRES was drawn up by the Atomteploeletkroproyekt [Nuclear Thermal Electric Power Station Planning Institute] Institute's Ural Division. The construction cost for this facility is estimated at about a billion rubles. The plan calls for the use of natural and associated gas from local fields to be used to produce the electricity. The station's total power comes to 4.8 million kW. The GRES-2 is made up of single-type power blocks of 800,000 kW capacity each. The GRES will be put on stream in two phases.

The basic equipment, which was delivered by enterprises from Leningrad, Zaporozhye, Taganrog and other cities, consists of high-output straight-through boilers, single-shaft steam turbines, turbogenerators and power transformers. The technical and design characteristics for this equipment corresponds to the best of the world's models, and insures provision of high technical and economic indicators during operation. Thus, the standard fuel needed to produce one kW/hour of electricity comes to 318 grams, which is an improvement on the level achieved for similar units now in operation.

The Surgutskaya GRES-2 is a highly-automated technological complex equipped with ASUTP [Automated System of Technological Process Control] with information and control functions. Computers are used to calculate the combined technical and economic indicators as well as the power blocks' operating modes.

The power station is being built by collectives of Zapsibenergostroy [Western Siberian Power Station Construction Trust], Sibenergomontazh [Siberian Power Station Equipment Installation Trust], Uralelektromontazh [Ural Electrical Equipment Installation Trust] and a number of other specialized subdivisions of USSR Minenergo and the contracting ministries.

Since construction began, that is 1982, R200 million of construction installation work has been completed, and over half of this was done last year. The primary thrust of the work was focussed on the No 1 power block, which was slated to be put on line in 1984. This, however, did not occur, due to lagging in the installation and trouble-shooting operations of some of the engineering units. The deadline for getting them into operation was moved forward to March of this year. What's more, start-up of the 2nd power block was scheduled for September. In order to accomplish this, some 80 million rubles' worth of work will have to be completed. About 60,000 m³ of housing is going to have to be commissioned for the construction workers and the operational personnel.

These are challenging tasks. In order for them to see completion, the construction and installation workers are going to have to increase their work rates and improve the state of their organization and production discipline. The center of attention will have to be the start-up and adjustment operations and the turning over for commercial operation of power block No 1.

In order to meet the intense deadlines for getting the start-up facilities for power block No 2 into operation, deliveries of equipment, preheaters, high-pressure piping and other equipment manufactured by the Barnaul Boiler Works, by Khimmash [Chemical Machine Building Plant] of Borisoglebsk, by Energomash [possibly All-Union Planning and Technological Institute of Power Machinery] of Belgorod, the Krasnyy Kotel'shchik Production Association of Taganrog, by Elektrosila in Leningrad and by Nasosenergomash, in Sumy, will have to be accelerated.

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NON-NUCLEAR POWER

BRIEFS

LIGHTWEIGHT TASH-KUMYRSKAYA GES GENERATOR--Novosibirsk--A hydraulic generator manufactured by a collective of the Sibelektrotyazhmash [Siberian Heavy Electrical Equipment] Plant, and sent to the Tash-Kumyrskaya Hydroelectric Power Station is 125 t lighter than its predecessors. The efforts of the designers who developed the machine--co-workers of the plant's scientific research institute--was not in vain, as is evident from the several inventor's certificates and the Exhibition of USSR National Economic Achievements gold medal. The Kirghiz hydraulic engineers will receive another of these units, with a capacity of 150,000 kw, by the end of the year. [By A. Lyakhov, SOTSIALISTICHESKAYA INDUSTRIYA correspondent] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 2 Feb 85 p 2] 12659

INSTALLING MIATLINSKAYA GES UNIT--Makhachkala--Installation of the impeller for the first hydraulic turbogenerator unit has begun at the Miatlinskaya GES, which is being built on the Sulak River in Dagestan. The construction site of the hydroelectric power station is squeezed into a narrow gorge, which means that assembling the 110-ton structure is a complicated undertaking here. That is why it was decided to assemble the unit inside the Chiryurtovskaya GES-1, which is in operation a few km downstream on the Sulak. The assembled impeller will be delivered to the machine room of the Miatlinskaya hydrosystem, thus accelerating the start-up of the station. Two turbogenerator units are to be installed at the Miatlinskaya GES, giving it a capacity of 220,000 kw. The plan calls for the first of them to be put into operation this year. The new GES is intended to relieve the peak energy system loads. Its water reservoir will be regulating the powerful flow of water which passes through the Chirkeyskaya Hydroelectric Power Station turbine, and will help to irrigate thousands of the arid hectares of the Caspian lowlands. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 5 Feb 85 p 1] 12659

POLISH POWER LINE OPERATING--Warsaw--As a result of three years of work in the Polish People's Republic, a 114-km, 750-kV power transmission line and its associated distribution station have been put into operation. The power line stretches from the border of Poland and the Soviet Union to Zhashuv. In so doing, the first stage of a collaborative construction project between Council for Mutual Economic Assistance countries, i.e., the USSR, the Hungarian People's Republic, the GDR, the Polish People's Republic and the CSSR, has been completed. The second stage will continue the power line on to Tarnow. The fact that this line is operating is proof of the continued integration of the power engineering systems of socialist countries. [By O. Losoto, PRAVDA correspondent] [Text] [Moscow PRAVDA in Russian 25 Dec 84 p 5] 12659

SMALL-SCALE HYDRAULIC TURBINE DEVELOPMENT--In reply to the article "The Energy of Lesser Rivers" (EKONOMICHESKAYA GAZETA, No 52, 1984), it was with good reason that the article pointed out the need to develop standardized hydraulic power engineering equipment for domestic, completely automated MGES's [small-scale hydroelectric power stations]. I wish to inform you that at the present time, the Syzran Turbine Manufacturing Plant, which is in charge of the project, and which has enlisted the cooperation of the NPO [scientific production association] of the TsKTI [Central Scientific Research and Planning-Design Boiler-Turbine Institute imeni I.I. Polzunov] and the Leningrad Metallics Plant and the Kharkov Turbine Plant imeni S. M. Kirov production associations, is developing technical proposals for standardized hydraulic turbines for small-scale hydroelectric power stations, which proposals are based on the technical requirements issued by USSR Minenergo. In 1985, following completion of this work, the Minenergomash proposals on organizing special production of hydraulic turbine equipment for small-scale hydroelectric power stations at the Syzran Turbine Manufacturing Plant will be presented to USSR Gosplan. [By A. Zaytsev, deputy USSR minister of power machine building] [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 7, Feb 85 p 16] 12659

KHUDONSKAYA GES DAM REDUCED--The Khudonskaya GES's arch dam, built on the Inguri River, has been subjected to integrated experimental investigations by the Department of Seismic Stability of Structures and Dam Research of the Georgian Scientific Research Institute of Power Engineering and Hydraulic Structures. The advice of these scientists helped the designers reduce the dam's volume and to attain a considerable economic effect. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 8, Feb 85 p 8] 12659

MARYYSKAYA GRES CONSTRUCTION CONTINUES--The construction workers of the flagship of Turkmen power engineering have started building the second phase of the Maryyskaya GRES imeni 50-letiya USSR. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 8, Feb 85 p 3] 12659

BUILDERS TO KATUN RIVER--In the wake of our advertisement about the series of hydroelectric power stations being built on the Altai Kray's Katun River, a multitude of letters were sent to the editorial board asking us to give the exact address of the construction administration, and to list the kinds of workers needed at the GES construction project. The project needs drivers, excavator and bulldozer operators, electric and gas welders, installation workers, finish workers, and workers of other specialties and trades. [Excerpts] [Moscow TRUD in Russian 26 Feb 85 p 4] 12659

BUREYA GES CONSTRUCTION CONTINUES--Talakan Settlement (Amur Oblast)--Several years ago, the first landing party of hydraulic engineers landed on the right bank of the Bureya River. They came from the neighboring Zeyskaya GES to build a temporary settlement at the Talakan dam site which had been selected by the surveyors and project planners as the site of the future hydroelectric power station. After the dam, which is 147 m high and almost 800 m long along its crest, connects Talakan's cone-shaped hills in a few years, the new GES will be the most powerful in the Far East. The first step toward taming the river was taken yesterday. The first cubic meter of concrete was poured into the body of the dam-to-be. And there are major tasks ahead. The two first

hydraulic turbogenerator units are to be put into operation by 1990. The industrial and agricultural enterprises of the fast-growing far eastern area await the Bureya's power, which they will use to develop the areas along the Baykal-Amur Mainline more quickly. [By Yu. Baklanov, SEL'SKAYA ZHIZN' correspondent] [Excerpt] [Moscow SEL'SKAYA ZHIZN' in Russian 22 Feb 85 p 1] 12659

NIZHNEKAMSKAYA GES COMPLETING CONSTRUCTION--Brezhnev (Tatar ASSR)--Erection of the Nizhnekamskaya GES has entered the final stage. Assembly has begun on the 16th and last unit. And work is simultaneously being carried out on the water reservoir flood zone. The work is being carried out in accordance with a precise timetable. The hydroelectric power station is both under construction and is in operation. Its generating units have already produced more than six billion kW/hours of electric power. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 8 Feb 85 p 1] 12659

ZAGORSK GAES CONSTRUCTION CONTINUES--In the city of Zagorsk, near Moscow, construction is in progress on a hydroelectric pumped storage power station with a capacity of 1,200,000 kw. Hydraulic engineers from the Ukraine, Armenia, Georgia, the Kirghiz SSR and Azerbaijan are taking part in this construction project. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 6, Feb 85 p 5] 12659

NIZHNEKAMSKAYA GES PROGRESS REPORT--Assembly has begun on the 16th and last unit at the Nizhnekamskaya GES. The hydroelectric power station is operating while being constructed. Its units have already produced over six billion kw/hours of electric power. The steam-generating turbines with the "Leningrad Metallics Plant" trademark have become quite a bit more economical following their modernization. These units have a capacity of 800,000 kw. Now each unit can save up to 12,000 t of standard fuel. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 7, Feb 85 p 3] 12659

ZHINVALI HYDROSYSTEM COMPLETING CONSTRUCTION--The Zhinvali hydraulic power system, in Georgia, has entered its final stage of construction. Four hydraulic turbogenerator units, having an overall capacity of 130,000 kw, are to be installed here. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 6, Feb 85 p 3] 12659

POWER LINE SPANS SAYANS--Sayanogorsk--A high-voltage LEP-500 [500 kilovolt power transmission line] has been erected from the Sayano-Shushenskaya GES to the industrial Kuznetsk Basin. The line's first electrical circuit has already been put into permanent operation, and the second circuit will be put into operation in October of this year. The lines, which proceed from the Sayano-Shushenskaya hydroelectric power station, which is the country's largest, will supply many of the kray's facilities with electric current. One of the lines crosses the ridges and taiga forests of the Western Sayan Mountain Range to the Tuva ASSR. [By P. Zinkev] [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 28 Feb 85 p 1] 12659

ELECTRIC POWER STATION UPDATE--The Sredneuralskaya GRES collective has appreciably increased its output of electric power in challenging winter conditions. Since the beginning of the year, about 20 million kW/hours have been put out here. Road laying to the Kambaratinskaya GES No 1, at Naryn has begun. This will be the most powerful hydroelectric power station in the Kirghiz SSR. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 10, Mar 85 p 3] 12659

GRES METALWORK PRODUCERS SCORED--One of this year's main goal-oriented tasks in the Western KATEK [Kansk-Achinsk Fuel-Energy Complex] area is installation of the Berezovskaya GRES-1 first power block. However, there are constant interruptions in the time-table caused by the poor quality of the metal structures being delivered by the Eastern Siberian Plant (located in the city of Nazarovo, N. Gorshakevich, director), and disruptions in deliveries of rolled metal stock from the KATEKsnab [KATEK Supply Administration], (headed by V. Lavrov). [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 10, Mar 85 p 18] 12659

BARNAUL BOILERMAKERS' ECONOMICAL DESIGNS--(Altai Kray)--At many of the country's TETs's [Heat and Electric Power Station], the water heaters manufactured by the Barnaul Boiler Works have given good account of themselves. The primary task of the Barnaul thermal power engineers is the development of new economical boilers which will operate on the cheap coals mined in Ekibastuz, the Krasnoyarsk Kray and Southern Yakut ASSR. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 10, Mar 85 p 19] 12659

CSO: 1822/186

PIPELINE CONSTRUCTION

PROBLEM OF PIPELINE RUST NEEDS ATTENTION

Moscow SOVETSKAYA ROSSIYA in Russian 27 Feb 85 p 1

[Unsigned article by a collective correspondent of SOVETSKAYA ROSSIYA, and the VECHERNIY CHELYABINSK editorial board: "Who Will Build "Everlasting" Pipe?"]

[Text] This winter, which was fairly severe, the inhabitants of many cities, Chelyabinsk among them, were forced to experience serious interruptions in their heat supply. As a result of breakdowns on the rights-of-way during the worst frosts, several houses, and even microrayons, found themselves cut off for days and even longer.

What is going on? Everyone knows that metal pipes rust. But it turns out that the actual operational life of the heat-supply pipes is from two to six years. No small number of scientists have thought about extending the service life of pipe.

An ordinary enamelled pot hinted at the solution. A durable glass-like coating, applied to the metal, has been known about since olden days. And when co-workers of the Ural Scientific Research Institute of the Pipe Industry, which is located in Chelyabinsk, came up with the idea of using enamel as an anticorrosive coating for pipe, they had come up with nothing essentially new. A method for applying the enamel on the interior and exterior of the pipe was worked out at the institute's pilot plant. The pipes thus treated were subjected to intensive tests. The scientists assured everyone that the enamel-coated pipe would last at least 50 years. At the same time--and this was approximately 10 years ago--the experimental lot of pipe joints were laid in various sections of the heat system route.

The Chelyabinsk party obkom and oblispolkom asked the USSR Ministry of Ferrous Metallurgy to examine the question of building an experimental-pilot shop in Chelyabinsk, to be used to produce 80,000 meters of enamelled pipe.

But Minchermet found it impossible to allocate the necessary assets at the time, but assured them that the problem of constructing this facility would be resolved prior to the end of the 11th Five-Year Plan period. And so it has been completed, however nothing has been changed for the better. Having heard of the procedure for enamelling heat-supply pipe, specialists in a number of cities began setting up semi-cottage-industry sections and shops.

Last summer in Volgograd a section, with an output capacity of up to 20 km of pipe per year, began work. But 2--3-fold more is needed to replace the old pipe. In the city of Gorkiy, they approached the problem in an extremely businesslike manner, but here, too, it was as if they were inventing the bicycle. In Moscow, they are setting up a shop with a 75-km pipe production capacity. It's a drop in the ocean of the capital's needs. And everywhere, everyone has their own organizational and technical variations--the Volgograd version, the Gorkiy version, Penza pipe....

The ten-year delay since the construction of the pilot shop in Chelyabinsk and the disparity in the localistic attempts to find a way out of the situation are but the appearance of a single root. Hitherto, the central point has not been determined: who is to step forward as the customer for enamel-coated pipe? And who is supposed to take up production of this pipe? They say that Minchermet is unable to take up the task of enamelling pipe on a large scale. It would seem that USSR Minenergo and the RSFSR Ministry of Housing and Municipal Services would show some interest in the production of this pipe, since it is precisely their subdivisions which are locally involved in operating and repairing the heat supply line mains and runs. But, alas, the staffs of these sectors, too, are conspicuous by their silence.

Subdivisions of the construction ministries are making the new heat conduits. It would be legitimate to expect that they too would have some interest in setting up a suitable production base--pipe enamelling shops. But here, too, there has been only silence so far. And in fact, it is most likely time for USSR Gosstroy to take a more active position and pay attention to the manufacturing procedure developed in Chelyabinsk, and to give their o.k. to the construction of special shops for this purpose. In brief, the problem requires a cardinal solution, the state-wide centralization of this business. Local variations are no longer working.

The fact that the pilot plant right in Chelyabinsk has been idle for ten years can only be cause for perplexity: there have been no customers for the pipe. The former management of Chelyabenergo, the rayon's power engineering administration, pretended not to have known of this innovation.

This winter, a lot of people were forced to reevaluate their position. Work is going to be restarted at the pilot plant this year, and the first kilometers of "everlasting" pipe are anticipated to be produced there. The problem of the rush construction of the shop has been solved by the plan which was prepared long, long ago. It's as if the ice has begun to break in Chelyabinsk. But there are still Kurgan and Tyumen, Chita, Irkutsk, Saratov and a lot of other cities.

Last autumn, in Chelyabinsk, they found the very first experimental pipes which were laid in the earth ten years ago. They cut some pieces out for examination. The scientists were astonished: there were no signs of damage to the enamel. That's exactly what we wanted: everlasting pipe!

PIPELINE CONSTRUCTION

BRIEFS

BAGAN FIELD PIPELINE GROWING--Usinsk (Komi ASSR)--The Usinsk-Bagan pipeline will help develop the new polar Bagan Oil Field at accelerated rates. The mechanized columns of Glavkomigazneftstroy [Main Administration for the Construction of Petroleum and Gas Industry Enterprises Komi ASSR] have started laying out the right-of-way. The length of the right-of-way under construction is 52 km in all. But it passes through the boggy circumpolar swamps. That is why the construction workers set up their time-table so as to be able to complete all the line work in March, and to connect this pipeline to the Usinsk-Ukhta-Yaroslavl main before the onset of the spring season of bad roads. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 19 Feb 85 p 1] 12659

UZBEKISTAN INCREASES GAS SUPPLY--Karshi, 6 Mar -- The natural gas of Shurtan Field was connected to the system of main pipelines which supply the cities and villages of Uzbekistan and adjacent republics with fuel today. The gas is moving along the new Shurtan-Mubarek transport main, which is 102 km long. A complex of installations which separate harmful contaminants out of the fuel has been built in the field, along with the new gas pipeline. The development of the fuel-energy base is continuing in the southern part of the republic. There are plans to put additional gas-purification installations into operation in the Shurtan Field by year's end. These installations will effect a 2-fold increase in deliveries of this high-quality and economic fuel to the national economy. [By V. Shumaylov, UzTAG correspondent] [Text] [Tashkent PRAVDA VOSTOKA in Russian 7 Mar 85 p 1] 12659

CSO: 1822/207

RELATED EQUIPMENT

RESIDENTS WARNED TO STAY CLEAR OF HIGH-PRESSURE GAS LINE

Tashkent SEL'SKOYE KHOZYAYSTVO UZBEKISTANA in Russian No 12, Dec 84 inside back cover

[Warning notice from the Uzbek Gas Transport Production Association, the Uzbek agency for the All-Union Advertising Trade Association (Telephone number: 45-37-27)]

[Text] WARNING: HIGH-PRESSURE GAS MAIN!

A main gas pipeline right-of-way, which is an expensive structure, and which has nation-wide significance, has been laid through the area of your rayon.

IT IS THE OBLIGATION OF EVERY CITIZEN TO TREAT THE GAS PIPELINE AND ITS STRUCTURES (CONNECTING LINES, CRANES, VALVES, SIGNS, CATHODE STATIONS, ETC.) WITH CARE.

REMEMBER: a gas pipeline is a highly dangerous source of explosion and fire hazard.

To avoid harm to humans and material damage within the gas pipeline's security area (250 meters to either side)

IT IS CATEGORICALLY FORBIDDEN:

- to erect any structure whatsoever;
- to set up any field harvest camps, threshing floors, or filling stations;
- to construct any watering places or enclosures for livestock;
- to put in any silo pits, to stack hay, or to set up areas for drying and storing cotton;
- to set up sand pits or other open-cast workings;
- to set up rubbish dumps, to burn straw or agricultural wastes;
- to permit gatherings of people, equipment or livestock.

Agricultural or construction and installation operations can be carried out within the security area only with the agreement of the Uzbektransgaz [Uzbek Gas Transport Production Association].

FOR THE INFORMATION OF THE POPULATION, DIRECTORS OF ENTERPRISES, CONSTRUCTION ORGANIZATIONS, KOLKHOZES AND SOVKHOZES, CONSTRUCTION WORKERS, CONSTRUCTION SUPERINTENDENTS AND MACHINE OPERATORS!

The following gas main pipelines have been laid within the territory of the Uzbek SSR:

Dzharkak-Bukhara-Samarkand-Tashkent;

Yangiyer-Fergana-Kokand-Namangan-Andizhan;

Gazli-Kagan-Samarkand-Tashkent-Frunze-Alma-Ata;

Kelif-Mubarek-Zirabulak--with branch lines off of indicated gas pipelines.

Buildings and structures built within the security area are subject to demolition.

The construction of roads, laying of cables, water lines and other underground, overhead or surface distribution pipelines, as well as laying out and developing new croplands in the area traversed by the main gas pipeline and the power transmission line alongside it must be carried out only with prior agreement!

The performance of unauthorized construction or earth-moving work within the gas pipeline security zone can lead to emergencies, accidents, material damage and other serious consequences.

ATTENTION DIRECTORS OF KOLKHOZES, SOVKHOZES, AND GOSKOMSEL'KHOZTEKHNIKI [State Committee for Supply of Production Equipment for Agriculture] ASSOCIATIONS!

In accordance with the Norms for Allocation of Lands for Main Pipelines SN-452--73, the utilization of lands located over underground main pipelines must be carried out, having taken measures to insure the safety of the pipelines.

To insure safety, an agreement must be obtained regarding use of the lands through which the gas pipeline is laid prior to any earth-moving work, from the Uzbektransgaz Production Association (Tashkent, GSP, 31 "a" Pedagogicheskaya Street).

An agreement can also be obtained by requesting same from gas main pipeline production associations in the following cities:

Kagan, Gallyaaral, Fergan, Aktash, Samarkand and Tashkent.

PAY ATTENTION AND BE CAREFUL NEAR MAIN GAS PIPELINES!

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RELATED EQUIPMENT

BRIEFS

PIPELINE INSULATING MATS PRODUCED--Salavat--Corrugated mats, which have been found to be reliable warmth-keepers, have been designed for use as heat insulation, and are now being produced by the Salavat Mineralized Products Plant. The strength and flexibility of this new insulating material, as well as its convenience, are enhancing labor productivity to a considerable degree. Dressed in this "fur coat", a pipeline holds its heat quite well. Plant specialists, working with scientists of the UralNIIstromproyekt [Ural Scientific Research Institute of Construction Material and Design] Institute have devised a special machine to manufacture the mats. [By I. Payvin, SOTSIALISTICHESKAYA INDUSTRIYA personal correspondent] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 21 Feb 85 p 2] 12659

CSO: 1822/212

GENERAL

EXPERIMENTAL LATVIAN FUEL, POWER PLANNING COMPLEX PROPOSED

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR in Russian No 2 (451) 1985 pp 113-118

[Article by K.A. Augstkalns, V.A. Zebergs, R.V. Soms and V.A. Tseyzin'sh: "Proposal to Establish an Interdepartmental Fuel and Power Planning Complex"]

[Text] The theoretical research done during the 10th Five-Year Plan or Improving the administration of the nation's fuel and power complex and further research during the 11th Five-Year Plan with the assistance of the Physics and Power Institute of the Latvian SSR's Academy of Sciences indicated the advisability of carrying out a practical experiment on establishing a fuel and power complex control system for an economic region (in this case, a republic), which would make it possible to verify decision-making procedures related to basic problems in areas concerning the establishment of hierarchical control systems. In this respect, the Latvian Republic offers a number of advantages: a small area, few local power resources and a large underground gas storage reservoir.

On the basis of theoretical research on the pressing practical problems of improving control of the republic's fuel and power complex and in order to reduce the proportion of local fuel and centralize fuel and power supply, an interdepartmental fuel and power planning complex for the republic is being set up. Development of specific tasks in Phase 1 of the project led to the need to review certain fundamental tenets of the theoretical development of regional fuel and power complex control systems. Rather than radically modifying the fuel and power complex control system, phased improvements are envisioned, due to relatively slow development of the republic's computer network and data transmission network. In addition, plans for developing fuel and power supply systems, particularly underground gas storage and the technical capabilities of its application in more complex operations are very important. Underground gas storage, which in time will be vitally important to improving gas supply reliability in general, also depends on the ability to integrate gas storage operations with the gas supply system control center for a large economic region in the northwest USSR.

Thus, in setting up a republic-wide fuel and power planning complex, one of the most important aspects is determining the sequence for converting individual functions to automatic operations and the sequence for automating control functions of individual fuel and power complex functions.

The fuel and power planning complex consists of three basic parts: (Fig. 1): an automated planning calculations system, automated departmental control systems for fuel and power supply systems and an automated functional control system for supplying the republic with fuel.

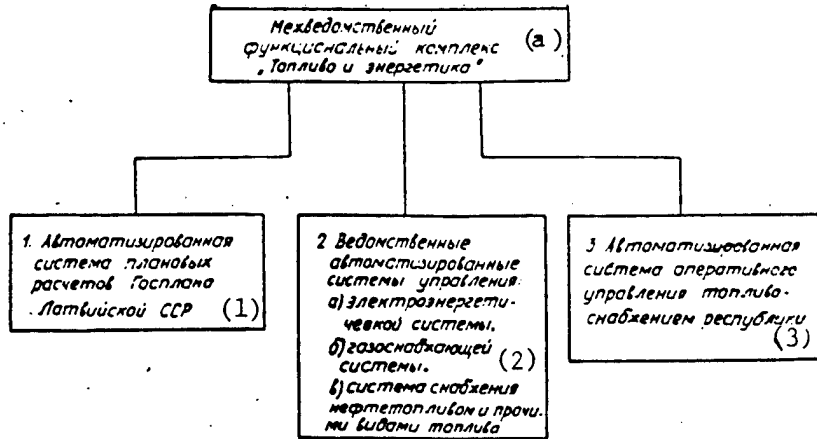


Fig. 1. Structural Organization of an Interdepartmental Fuel and Power Planning Complex

Key:

- | | |
|---|---|
| a. Interdepartmental Fuel and Power Planning Complex | 1. Automated Planning Calculations Center of the Latvian SSR State Planning Committee |
| 2. Automated Departmental Control Systems: (a) Electrical Power System; (b) Gas Supply System; (c) Petroleum and Other Fuel Supply System | 4. Republic Automated Fuel Supply Planning Control System |

Under Phase 1 of an automated calculations system for planning the fuel and power supply of the republic, automation of existing planning calculations is envisioned. This has essentially been done and speeds up the formulation and flexibility of planning calculations. Phase 2 envisions the implementation of mathematical "Sovetchik" models for optimizing distribution and fuel selection planning on the basis of consumers' technical and economic criteria and the costs of supplying various fuels to the consumers. Analysis of mathematical methods indicated the advisability of applying the optimal fuel and power complex development method worked out by the Central Institute of Economics and Mathematics of the USSR Academy of Sciences, a modification of which may be used to optimize fuel distribution in on-going fuel supply planning.

This method makes it possible to draw up more accurate five-year plans (and shorter plans) for fuel deliveries, taking into account the development of fuel supply systems and optimizing fuel redistribution by taking into consideration individual consumers' conversion to other kinds of fuel. Performance of calculations by this method is envisioned at the Main Time-Share [kollektivnogo pol'zovaniya] Computer Center of the Latvian SSR State Planning Committee.

The first phase of its work will require setting up a group of specialists to produce optimization models of input data and data updating as new power facilities are brought on stream or rebuilt. As a republic-wide data transmission network is developed, data collection may be automated.

In the long term, a fundamental effort must be made to improve the fuel and power supply planning system itself, particularly with regard to the development of a standardization and planning system when functionally coordinating results at all levels (with automated collection [agregatsiya] and dissemination [desagregatsiya] of the data in question) with a two-way tie when fuel and power supply planning comes to be based on scientifically established lower-level norms.

Development of an automated planning control system for republic-wide fuel supply is more complex than automating planning calculations. If a single entity, i.e., the State Planning Committee of the Latvian SSR, is in charge of planning, planning control of fuel supply is spread among various departments and kinds of fuel. Data on requirements of varying priority, including daily requirements as necessary, are received at the State Planning Committee and the Council of Ministers of the Latvian SSR, which under extraordinary fuel supply or consumption conditions, make decisions on fuel distribution, switching given consumers to other kinds of fuel or the imposing various limits on fuel consumption.

For an automated regional fuel supply system to function, all control functions affecting the redistribution of fuel of all kinds in the republic must be concentrated in a single entity, and this entity must be given sufficient enforcement power.

Many years of experience in controlling electrical power systems has shown that it is advisable to have a central control function when there are several control functions for different systems and power plants, in spite of the fact that under normal power supply conditions central control personnel may have relatively little to do for long periods of time (they may only monitor the economic indicators of power plant operations and carry out emergency drills), but in emergencies, they are responsible for preventing power outages and consequent problems.

On the basis of this experience, the establishment of a republic planning control center should be planned in order to automate a republic-wide fuel supply control system. In a fuel supply system, it is very important to establish the hierarchical position of this function correctly. Its subordination to any of the fuel supplying organizations might not provide adequate safeguards from departmental interests. In order to avoid this, the republic center should be directly responsible to the Latvian SSR Council of Ministers (Fig. 2). Phase 1 of a republic-wide automated fuel supply planning control system includes automating data transmission through communications channels within the Latgla-energo System only and partly within the Latvian SSR Goskomnefteprodukt and Gaskomgaz Systems, as well as among the main time-share computer center, the Central Control System of the Latvian SSR's Republic Computer Center and the republic fuel supply planning control system. Remaining data paths will be automated as data and measuring equipment is obtained and installed and a republic-wide data transmission network is set up.

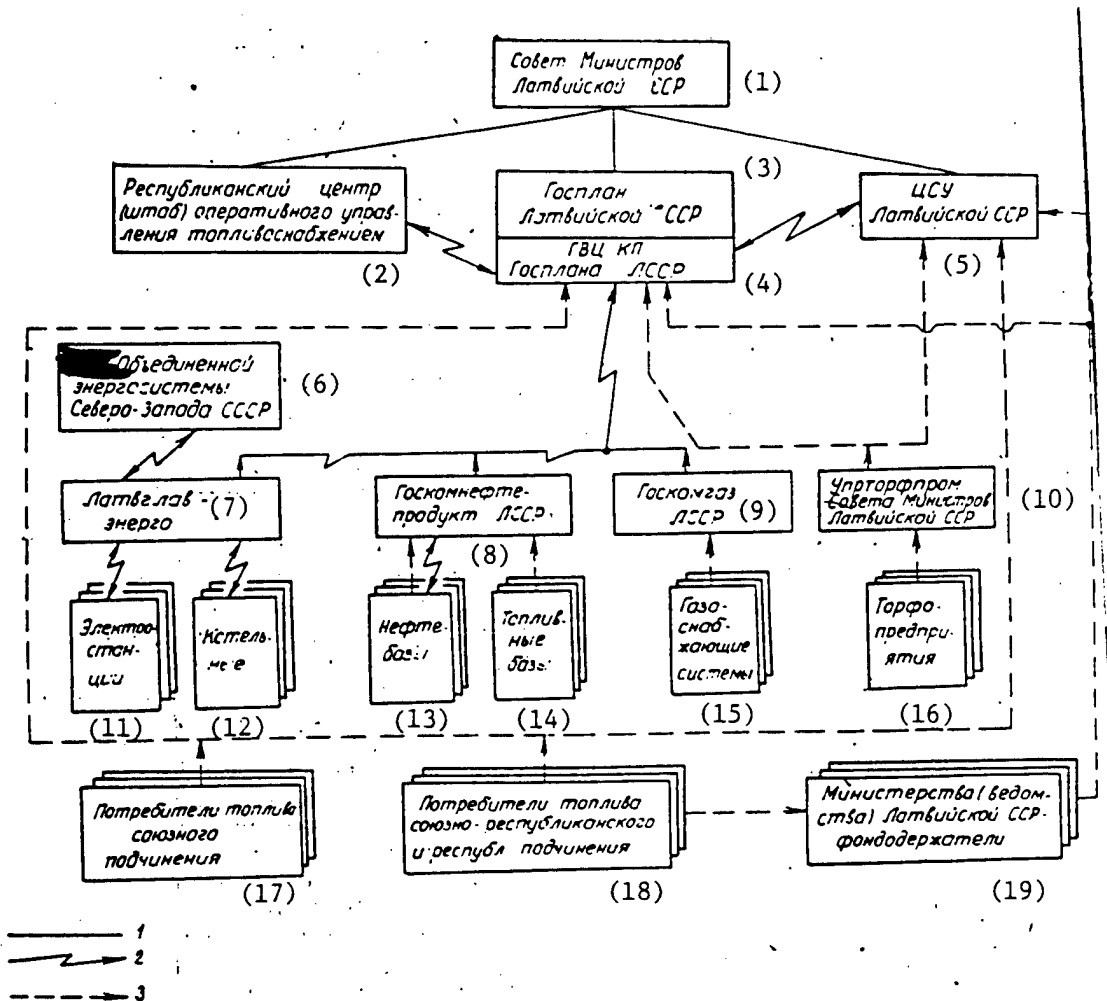


Fig. 2. Proposed Organizational Chart for a Latvian SSR Fuel Supply Planning Control System

Legend: 1. Administrative Organization Lines
2. Data Paths Automated under Phase 1
3. Non-Automated Data Paths

Key:

1. Latvian SSR Council of Ministers
2. Republic Fuel Supply Planning Control Center (Staff)
3. Latvian SSR State Planning Committee
4. Main Time-Share Computer Center of the Latvian SSR State Planning Committee
5. Latvian SSR Central Control System
6. United Northwest USSR ODU

7. Latglavenergo
8. Latvian SSR Goskomnefteprodukt
9. Latvian SSR Goskomgaz
10. Uprtorfprom of the Latvian SSR Council of Ministers
11. Power Generating Plants
12. Boiler Units
13. Oil Depots
14. Fuel Depots
15. Gas Supply Systems
16. Peat Enterprises
17. Union-Level Fuel Consumers
18. Republic and Republic/Union-Level Fuel Consumers
19. Latvian SSR Ministries (Departments) Resource Holders

In the future, natural gas will become the basic boiler and furnace fuel for some time to come, and as technical capabilities are developed the role of the gas supply system and underground gas storage as a back-up for fuel consumption and supply problems and as adequate rules are written regulating the republic gas supply system (republic reserve limits for underground gas storage), even the issue of transferring certain control functions from central control to gas supply system control will become serious. This will greatly facilitate the implementation of mathematical methods and models for the controlling republic fuel supply planning. However, a group of specialists in the gas supply system must be set up to utilize mathematical models for economic redistribution of fuel and reserves and impose limits as well as gas supply system control models for emergency conditions, etc. With the assistance of the republic's gas supply system specialists, it will be easier to organize the production of models for controlling gas supply system technical and economic input data. Gas supply system specialists are currently working out a schedule of priorities for converting consumers to other fuels under emergency conditions enterprise by enterprise and thermal power plant by power plant. However, it is doubtful that the authority mentioned above will be given to the gas supply system in the near future. So, in the light of preliminary evaluation of the current situation in the area of the country's fuel supply through 1985 and possibly through 1990, the back-up fuel for the republic's consumption and supply emergencies will essentially be fuel oil and buffer consumers [sic--buffernyye potrebiteli]. Thus, fuel oil reserves in the republic's electrical power system are of great importance.

Both an automated fuel supply planning control system for the republic and an automated system for handling fuel and power supply planning calculations are based to a large extent on automated departmental control systems at fuel and power supply entities, although at first these systems will be developed independently. At the same time, automated departmental fuel and power supply control systems are at different stages of completion and this fact to a large extent predetermines their future development.

The most advanced is the automated electrical power system departmental control system, where Phase 2 of planning and planning control is planned, in addition to a data and interrogation system, including data output at the upper-level of the republic's fuel supply planning control system.

The automated departmental distribution gas supply control system for the republic is in the initial stage of development. Phase 1 of the automated control system for the technological processes of the distribution gas supply system envisions the installation of measuring and data facilities at the largest gas consumers to measure gas consumption and determine other gas supply system parameters and the establishment of a republic gas supply system computer center to process these data. The fundamental difficulties here are expected to be the delay in developing and manufacturing gas supply system metering and data-gathering equipment. The practical implementation of Phase 1 can be expected only in the 12th Five-Year Plan. By 1985 the republic's gas supply system data and interrogation system must be developed, including upper-level data output by the republic's fuel supply planning control system.

The automated control system for supplying the republic with solid and liquid fuels should also be developed at the beginning. In order to set up an automated control system for the technological processes of supplying the republic with solid and liquid fuels, the installation of microcomputers at all solid and liquid fuel depots in the republic is planned to provide preliminary data processing services. In addition, Phase 1 of an automated control system for supplying solid and liquid fuels includes setting up a data and interrogation system which will also provide upper-level data of a republic fuel supply planning control system. Automated transmission of this information to a republic fuel supply planning control center is planned under Phase 1.

After accomplishing the start-up tasks of Phase 1 of the interdepartmental fuel and power planning complex, there still remain various stages in the development of automated control systems for fuel and power suppliers in the republic. A summary of the developmental status of the automated control systems of the various departments as of the end of the 12th Five-Year Plan is given by function in the accompanying table.

The relatively slow development of automated control systems for the technological processes of the republic's gas supply system and the republic's solid and liquid fuel supply systems is causing certain difficulties in the implementation of the functional control of supplying the republic with fuel, lowering efficiency, especially in Phase 1.

CONCLUSIONS

1. In planning a regional fuel and power supply control system, the development of a republic computer network and capabilities of energy supply systems to contribute reserves to compensate for fuel supply and consumption disruptions must be taken into account.
2. The basic user of Phase 1 of an automated system handling planning calculations for fuel and power supply is the Latvian SSR State Planning Committee. The system is being implemented on the technological base of the main time-share computer center belonging to the Latvian SSR State Planning Committee.
3. The proper hierarchical position of the republic's fuel supply control center is an important aspect in the development of an automated functional fuel supply control system.
4. In the further development of the gas supply system and expansion of the role of gas in the republic's economy, and also in setting up a computer center for the gas supply organization and installing communications with the Latvian SSR State Planning Committee's main time-share computer center, the majority of the tasks in servicing the automated functional fuel supply control system of the republic may be assigned in time to specialists in the republic's gas supply system.
5. The automated departmental systems in the republic's fuel and power supply organizations are a base for the development of a functional automated fuel supply control system for the Latvian SSR, but these departmental systems are

not being developed fast enough. Accelerating their development is one of the most urgent tasks in the implementation of an interdepartmental fuel and power planning complex.

Иерархические уровни управления (2)	Функции управления (1)				
	Планирование (3)	Оперативное управление (4)	Управление технологическими процессами (5)		
			энерго- снабжающих систем (6)	топливо- снабжающих систем (7)	потреби- телей энергии (8)
Верхний уровень управления (Госплан ЛатвССР, Совет Министров ЛатвССР)	Автоматизированная система плановых расчетов Госплана ЛатвССР	Автоматизированная система оперативного управления топливоснабжением	—	—	—
Средний уровень управления (министерства, ведомства)	Ведомственные автоматизированные системы управления и система передачи данных на верхний уровень*	—	—	—	—
Нижний уровень управления (предприятия и технологические процессы)	Автоматизированные системы управления топливо- и энергопотребителей и система передачи данных на средний уровень**	—	Электро-станции и районные котельные	Газопроводы и топливные базы*	Предприятия*

* Неполная автоматизация.
** Частичная автоматизация.

(9)

DEVELOPMENTAL STATUS OF COMPONENTS OF THE INTERDEPARTMENTAL FUEL AND POWER PLANNING COMPLEX

Key:

1. Control Functions
2. Control Levels
 - Upper Level: Latvian SSR State Planning Committee and Council of Ministers
 - Mid Level: Ministries, Departments
 - Lower Level: Enterprises and Technological Processes
3. Planning
 - Automated Planning Calculations System of the Latvian SSR State Planning Committee
 - Automated Departmental Control Systems and System for Trans-
4. Planning Control
 - Automated Fuel and Power Supply Planning Control System
5. Technological Process Control
6. Power Supply Systems
7. Fuel Supply Systems
8. Power Consumers
9. *Not fully automated.
**Partially automated.

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GENERAL

POWER, ELECTRIFICATION MINISTRY SOCIALIST OBLIGATIONS SET

Moscow ENERGETIK in Russian No 4, Apr 85 pp 1-4, 41

[Socialist Obligations of the Workers, Engineers, Technicians and White Collar Personnel of the Enterprises and Organizations of the USSR Ministry of Power and Electrification for 1985]

[Text] In the aim of carrying out the quotas of the USSR Energy Program, the efforts of the power workers and power construction workers during the final year of the 11th Five-Year Plan should be aimed at the following:

- a) Dependable power supply for the national economy and the needs of the public for electric and thermal power;
- b) Accelerating scientific and technical progress in the sector;
- c) Sharply reducing the time and improving the quality of repairs;
- d) Significantly reducing the gap between the installed and available capacity;
- e) The rational management of the system, strengthening the struggle for saving fuel and other material-technical resources;
- f) Increasing the amount of work to modernize and reconstruct the aged power equipment;
- g) Increasing the dependable operation of the Ekibastuz GRES-1 [state regional power plant];
- h) Ensuring the on-time and early completion of capacity and primarily at the nuclear power plants [AES], the Surgut GRES-2, the Berezovskaya GRES-1, the Perm GRES as well as the power projects of the Far East and Central Asia.

In being guided by the decisions of the October (1984) Plenum of the CPSU Central Committee and by the provisions and conclusions set out in the speech of the General Secretary of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet, Comrade K. U. Chernenko, at a session of the Politburo of the CPSU Central Committee on 15 November 1984 and endeavoring to greet the 27th CPSU Congress with high labor achievements, the workers, engineers, technicians, scientists and white collar personnel in the sector have

actively joined the socialist competition and for 1985 have adopted the following socialist obligations.

In the Area of Electric Power

By optimizing the production structure of electric power at the thermal, hydraulic and nuclear power plants, by increasing the technical level of operations and by carrying out a range of measures to modernize the replace aged equipment, to overfulfill the product sales plan by 115 million rubles.

To reduce proportional fuel consumption at the thermal power plants [TES] to 325.9 gm/(kilowatt hour), and in comparison with 1984 to obtain a savings of at least 0.9 million tons of fuel units, including 0.1 million ton above the plan.

In supporting the initiative of the nation's leading enterprises, to operate 2 days using the saved materials and fuel and here provide the required output of 6 billion kilowatt hours of electric power without additional expenditures of organic fuel.

To increase the available capacity of operating power plants by 3.6 million kilowatts by eliminating the gaps and restricting capacity, by increasing its output over the power transmission lines and carrying out repair and reconstruction work.

To cut in half the standard time for reaching design capacity at the power unit No 1 of 1 million kilowatts at the Zaporozhye AES and reduce by 2 weeks the time for the power unit No 2 of 1 million kilowatts at the Southern Ukrainian AES and thereby additionally generate 600 million kilowatt hours of electric power. This will make it possible to save 200,000 tons of fuel units.

To reach design capacity ahead of time at the power units put into service at the Balakovo, Smolensk and Kursk AES so that they completely participate in covering the autumn-winter maximum loads of 1985-1986.

In the aim of raising the technical level and operating reliability as well as reducing proportional fuel consumption, to modernize the equipment of the TES with a power of 5 million kilowatts and extend the operating life of the existing power units with a total capacity of 2 million kilowatts.

On the basis of improving repair methods, increasing the amount of repairs done by the factory method, increasing responsibility for the quality of repairs, certification and rationalization of the work areas, widely introducing the brigade forms of organizing labor and carrying out other organizational and technical measures:

- a) To shorten the time of equipment repairs by 1 percent in comparison with the plan, including by 0.4 percent for the power units and thereby generate 450 million kilowatt hours of electric power;
- b) To complete the 1985 repair campaign for basic and auxiliary equipment involved in covering the load maximum, and to draw up the availability certificate for operating the power plants under winter conditions by 15 November 1985;

c) To increase the number of repaired units with an evaluation of "good" and "excellent" to 91 percent.

By saving material and technical resources, improving the utilization of equipment, mechanisms and means of transport and by reducing working time losses, to lower the cost of electric and thermal power by 0.3 percent above the established quota.

To exceed the quota for introducing the brigade forms of organizing and encouraging labor in electric power and bring the level of coverage by these forms up to 61.5 percent of the total number of workers and industrial-production personnel.

To organize a socialist competition with the suppliers of electric power (Minenergomash [Ministry of Power Machine Building], Minelektrotekhprom [Ministry of Electrical Equipment Industry] and Minkhimmash [Ministry of Chemical and Petroleum Machine Building]) following the "Worker Relay" principle.

To study and disseminate the experience of the leading collectives: the Lukomlskaya, Kostroma and Reftinskaya GRES, the Bratsk GES and the Kola AES. To ensure dependable operation of the Ekibastuz, Syrdarya, Novochoerkassk, Yayva and other lagging power plants.

In the Area of Capital Construction

On the basis of widely introducing industrialization, improving the methods and organization of construction, to complete the planned capital investments for the construction of AES by 22 December 1985.

On the basis of widely disseminating the work method of personal savings accounts and reducing losses from defective workmanship, to achieve an above-planned savings in material resources in construction and operate at least 2 days a year employing the saved materials.

To complete power capacity at the power plants totaling at least 13.8 million kilowatts, including 4 million kilowatts at AES, with:

At the AES

Power Unit No 2 of 1,000 megawatts at the Smolensk AES in April;

Power Unit No 1 of 1,000 megawatts at the Balakovo AES in May;

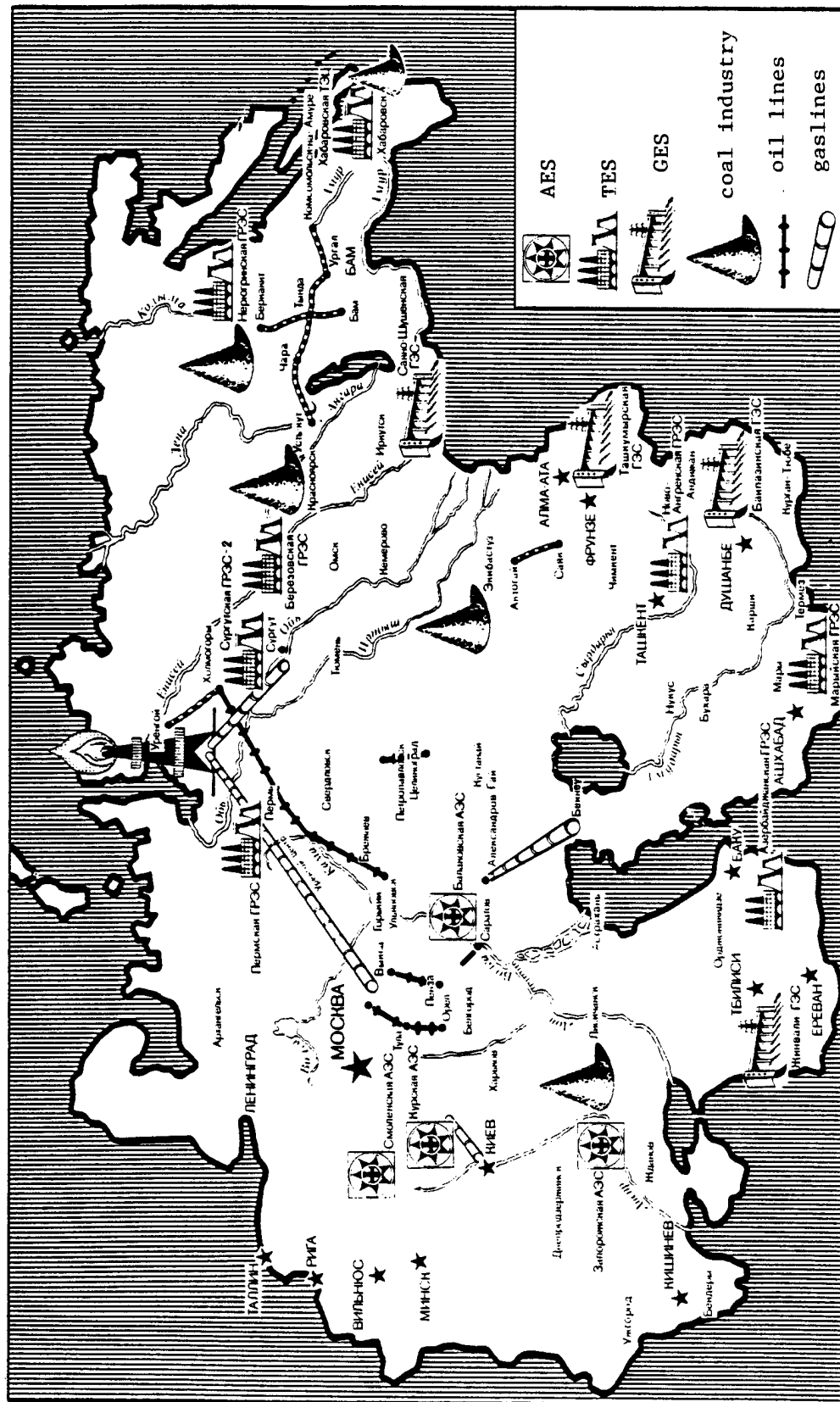
Power Unit No 3 of 1,000 megawatts at the Kursk AES in December;

At thermal power plants:

Power Unit No 2 of 800 megawatts at the Surgut GRES-2 in September;

Power Unit No 1 of 800 megawatts at the Perm GRES in December;

Power Unit No 1 of 180 megawatts at the Novosibirsk TETs-5 in December.



Major Power Projects for 1985

To complete the following power transmission lines:

The 500-kilovolt line between the Sayano-Shushenskaya GES--Novokuznetsk in September;

The 500-kilovolt line between the Azerbaijan GRES--Apsheron in November.

To put under rated voltage of 1,150 kilovolts the power transmission line of Ekibastuz--Kokchetav in May; the section Kokchetav--Kustanay in December.

To complete above the state plan the hydropower Unit No 10 of 640 megawatts at the Sayano-Shushenskaya GES.

To complete ahead of time:

The boiler Unit No 6 with a steam rating of 420 tons per hour at the Omsk TETs-5 and the Bobruysk--Kaliynaya 330-kilovolt power transmission line--both a month ahead of schedule;

The Yamburg--Yambur GTS 110-kilovolt power line 3 months ahead of schedule.

By the 40th anniversary of the victory of the Soviet people in the Great Patriotic War:

To provide the physical starting of the reactor in the second power unit of 1,000 megawatts at the Zaporozhye AES and put it into service in May.

To complete the Surgut--Kholmogory 500-kilovolt transmission line (with a planned date of the second quarter).

By the 50th anniversary of the Stakhanovite movement:

To complete boiler Unit No 15 with a steam rating of 420 tons per hour at the Ufa TETs-4.

By Power Worker Day to complete:

Power Unit No 3 of 180 megawatts at the Neryungri GRES;

Power Unit No 5 of 300 megawatts at the Azerbaijan GRES;

Power Unit No 2 of 80 megawatts at the Astrakhan TETs;

The turbogenerator at the Amur TETs-1;

The hydropower Unit No 3 of 107 megawatts at the Mayna GES;

Hydropower Unit No 2 of 200 megawatts at the Zagorsk GAES;

The Komsomolskaya--Vysokogornaya 220-kilovolt power transmission line;

The Fevral'skaya--Urgal 220-kilovolt power transmission line.

In 1985, to successfully complete installation work at the second power unit of the Kalinin AES, the third power unit of the Zaporozhye AES, the third power unit of the Rovno AES in the aim of putting them into service ahead of time in 1986.

For establishing the necessary fuel supplies for the autumn-winter load maximum, to put into operation mazut storage capacity with a volume of at least 750,000 m³, including at least 450,000 m³ over the 9 months.

By introducing advanced labor procedures and methods, progressive production methods, advanced scientific and technical achievements, by more fully utilizing machinery and equipment and further improving the organization of production and construction management, to increase labor productivity by at least 4.2 percent.

Due to the economic consumption of material and other resources as well as improving work quality, to reduce the cost of construction-installation work by at least 0.1 percent in addition to the plan quotas.

To utilize 3 million tons of ash and slag waste products in construction.

To complete at least 76 percent of the industrial projects with good and excellent assessments, 85 percent of the power transmission lines and substations and 75 percent of the housing and social and service projects.

To carry out all the quotas according to the plan for introducing new equipment, to introduce at the construction sites 38 prototypes of new machinery and equipment and thereby obtain an economic effect amounting to 85 million rubles which is 5 million rubles more than in 1984.

To exceed by 1 percent the annual quota for the volume of construction-installation work carried out by the brigade contract method and bring it up to 53 percent.

To provide a further improvement in the methods of the engineer preparations for construction on the basis of widely using comprehensive network schedules and computers.

In 1985-1986, in building AES with VVER-1000 [water moderated power reactor] units to introduce a standard reusable system of production documents.

To accelerate the transition to flow methods of organizing construction at the major thermal power projects (KATEK [Kansk-Achinsk Fuel and Power Complex], the Ekibastuz Fuel and Power Complex and in Western Siberia).

In the Area of Producing Industrial Products at the Construction Industry Enterprises

By improving the utilization of production capacity, by bettering production methods, the forms and methods of labor, by reducing working time losses, by certifying work areas and their rationalization, to provide an above-planned increase of 1 percent in labor productivity and thereby produce 20 million rubles

of product. To obtain 85 percent of the entire increase in the production volume from a rise in labor productivity.

By reducing the losses and by better utilization of materials and energy, to operate 2 days a year using the saved resources.

To reduce the cost of commodity product by 0.2 percent additionally over the plan.

To continue work in improving the brigade forms of organizing labor in the construction industry and have it cover 70 percent of the total number of industrial-production personnel.

To provide the complete delivery of structural elements to the most important nearly completed energy construction projects 5 days ahead of the date stipulated by the contractual obligations.

To certify 45 product types in the superior quality category.

In the area of scientific research, design and engineering work, in the development and introduction of new equipment.

In deepening and broadening the initiative of the Gidroproyekt [Scientific Research and Design Institute for Hydraulic Engineering Projects] imeni S. Ya. Zhuk to increase the scientific and technical level of the plans and thereby reduce the estimated cost of project construction, to achieve an effectiveness from introducing scientific research in the energy area into production of at least 2.1 rubles per ruble of investments into scientific research and obtain a real national economic effect totaling 164 million rubles which is 10 million rubles more than in 1984.

By increasing the scientific and technical level of the designs, by reducing the labor and material intensiveness of the projects and by standardizing and unifying the design ideas, to provide:

A reduction in the cost of energy construction by 105.5 million rubles and this is 15.5 million rubles more than in 1984;

A savings of 118,200 tons of metal and 130,200 tons of cement;

A reduction in labor expenditures in construction by 3.1 million man-days.

To ensure the fulfillment of the quotas of 1985 and the 11th Five-Year Plan as a whole for 8 specific integrated programs and 24 major scientific and technical problems.

To complete ahead of time, by 28 June 1985, the elaboration and submission of working specifications for the 1986 volume of construction-installation work on nearly completed projects.

In commemoration of the 40th anniversary of the victory of the Soviet people in the Great Patriotic War, to complete 1 month early:

The thermal balances for Leningrad for the general development plan of Leningrad and Leningrad Oblast;

The plans for the nation's first semipeak Kanev GAES designed to ensure operational reliability and economicness of the nuclear, thermal and hydraulic power plants.

To work out ahead of time, by Power Worker Day, the plans for heat supply to Odessa from the Odessa ATETs which will make it possible to save around 1 million tons of organic fuel a year.

In the Area of Personnel Work

The most important conditions for successfully carrying out the economic and social development plans of the sector are: increasing the responsibility as well as the labor and political activeness of the workers, strengthening order and discipline and increasing the skills of the engineers, technicians and workers.

For achieving this goal:

To reduce personnel turnover, in comparison with 1984, by 1.7 percent in power production, by 5 percent in power construction and by 1.5 percent in the construction industry;

To reduce working time losses in operational activities by 18 percent and by 10 percent in power construction;

In the system of schools under the ministry and at the enterprises to train at least 73,000 new workers;

To organize instruction at courses in the aim of improving the skills of 345,000 workers.

In the Area of the Social Development of the Collectives

In the aims of further improving the working, domestic and leisure conditions of the workers, for the professional training of workers, engineers, technicians and white collar personnel in the sector, to build and put into operation in the towns and settlements of the power workers and power construction workers at least 2.5 million m² of housing, nurseries with 13,000 places, general educational schools for 18,000 students, vocational-technical schools for 2,600 places, hospitals with 890 beds and polyclinics for 5,000 visits a shift.

To increase the output of consumer goods by 10 percent, in comparison with 1984.

To fulfill ahead of time, by 28 December, the plan for product output by the public dining enterprises and by 30 December, the overall plan for retail commodity turnover by the Glavurs [Main Worker Supply Administration] enterprises.

To sell above the plan foodstuffs and industrial goods valued at 5 million rubles and 1.5 million rubles of own products. Over the year to sell 90 million

rubles more of commodities than in 1984 and increase the output of own products by the public dining enterprises by 9 million rubles.

In the towns and settlements where power workers and power construction workers reside, to put into operation at least 50 stores with a total area of 27,532 m², dining rooms for 9,075 seats, vegetable storage facilities for 10,650 tons of vegetables, warehouses with a total area of 18,782 m² and refrigeration capacity for 5,280 tons of products.

In the Area of Carrying Out the USSR Food Program

To supply agriculture with 142 billion kilowatt hours of electric power or 6 percent more than in 1984; also 3.2 million tons of shale ash for liming the soil.

To achieve a significant rise in the reliability of power supply for agriculture, for which we must:

Provide 310 transformer substations of 35-110 kilovolts with reserve power and 390 of these substations with second transformers;

To carry out major repairs on the rural electrical networks with a voltage of 0.4-20 kilovolts to a total of 150 million rubles, or 11 percent more than the 1984 level.

To provide reserve electric power for at least 1,700 livestock facilities, poultry farms and farms;

To put into operation 116,000 km of power transmission lines with a voltage of 0.4-110 kilovolts for electrifying agriculture following the title lists of the USSR Ministry of Power and Electrification, or 4 percent more than was completed in 1984.

The annual plan for building power networks with a voltage of 10 kilovolts for land reclamation projects of the RSFSR Ministry of Land Reclamation and Water Resources a month ahead of time and by 9 May 1985, produce an additional 20 mobile substations.

On the kolkhozes and sovkhozes to carry out work providing help in repairing the power units of the grain cleaning points, the elevators and field camps by the start of the harvest season and with a cost of at least 2.5 million rubles.

To work out ahead of time the design and estimate specifications for power supply for 2,200 agricultural projects in the RSFSR Nonchernozem Zone, including for 120 power supply projects for livestock complexes and poultry farms.

In the Area of Environmental Conservation

To complete above the plan 1 million rubles of construction and installation work for building nature conservation projects.

To reconstruct and provide major overhaul for the ash-recovery equipment on 40 boiler units.

To carry out measures to reuse treated waste water in the industrial water supply systems at the Blagoveshchensk TETs, the Irkutsk TETs-11, the Tyumen TETs, the Zmiyevka GRES, the TETs-8 and TETs-22 of Mosenergo [Moscow Power Administration] with a total volume of 11 million m³.

The workers, engineers, technicians and white collar personnel of the sector are fully determined to celebrate the 40th anniversary of the victory of the Soviet people in the Great Patriotic War and the 50th anniversary of the Stakhanovite movement. They assure the Leninist CPSU Central Committee that they will make every effort to carry out the assumed socialist obligations, to fulfill the 1985 plan ahead of time and carry out the quotas of the USSR Energy Program as well as celebrate the 27th CPSU Congress with new labor achievements.

[Editorial Note] The socialist obligations have been discussed and adopted in the enterprises and organizations of the USSR Ministry of Power and Electrification and have been approved at an enlarged session of the ministry collegium and by the Presidium of the Central Committee of the Trade Union for Workers of Power Plants and the Electrical Engineering Industry of 28 January 1985.

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